National Library
of Canada

Canadian Theses Service

Ottawa, Canada
K1A 0N4

Bibliothèque nationale
du Canada

Service des thèses canadiennes

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

NL-339 (r. 88/04) c

Canada

UNIVERSITY OF ALBERTA

Estimating the Effects of Early Intervention with Structural Equation Modeling

BY

Mary A. Perry

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND
RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF HEALTH SERVICES ADMINISTRATION

DEPARTMENT OF HEALTH SERVICES ADMINISTRATION
AND COMMUNITY MEDICINE

EDMONTON, ALBERTA

SPRING 1992

National Library
of Canada

Bibliothèque nationale
du Canada

Canadian Theses Service

Service des thèses canadiennes

Ottawa, Canada
K1A 0N4

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-73038-2

Canada

December 12, 1991

Ms. Arlene Sullivan
The Johns Hopkins University Press
701 West 40th Street
Suite 275
Baltimore, Maryland 21211
U.S.A.

Dear Ms. Sullivan:

As we recently discussed per telephone, I am a graduate student working with Dr. Leslie A. Hayduk at the University of Alberta in Edmonton. I am seeking permission to copy a page from his text entitled "Structural Equation Modeling with LISREL -- Essentials and Advances" (1987); I understand that your office holds the copyrights to this book.

It is the figure on the inside cover of his book i.e. The Summary of the General Structural Equation Model, which I wish to reproduce in ten copies of my master's thesis entitled Estimating the Effects of Early Intervention with Structural Equation Modeling. Dr. Hayduk is a member of my thesis committee and has no objections to the use of this figure in my paper.

Please return all correspondence to:
Mary A. Perry
2772 Signal Hill Drive S.W.
Calgary, Alberta T3H 2L9
CANADA

Thank-you for your assistance with this matter.

Yours truly,

M. A. Perry

Mary A. Perry
M.H.S.A. Candidate

PERMISSION GRANTED:

Arlene W. Sullivan

Arlene W. Sullivan, Assistant to the Director
Rights & Permissions Date: 12.24.91

THE JOHNS HOPKINS UNIVERSITY PRESS
701 West 40th Street, Suite 275
Baltimore, Maryland 21211

UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR: Mary A. Perry

TITLE OF THESIS: Estimating the Effects of
Early Intervention with
Structural Equation Modeling

DEGREE: Master of Health Services Administration

YEAR THIS DEGREE GRANTED: 1992

PERMISSION IS HEREBY GRANTED TO THE UNIVERSITY OF ALBERTA LIBRARY TO REPRODUCE SINGLE COPIES OF THIS THESIS AND TO LEND OR SELL SUCH COPIES FOR PRIVATE, SCHOLARLY OR SCIENTIFIC RESEARCH PURPOSES ONLY.

THE AUTHOR RESERVES OTHER PUBLICATION RIGHTS, AND NEITHER THE THESIS NOR EXTENSIVE EXTRACTS FROM IT MAY BE PRINTED OR OTHERWISE REPRODUCED WITHOUT THE AUTHOR'S WRITTEN PERMISSION.

Mary A. Perry
(Student's Signature)

2772 Signal Hill Drive S.W.
(Student's Permanent Address)

Calgary, Alberta

T3H 2L9

Date: December 9, 1991

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

THE UNDERSIGNED CERTIFY THAT THEY HAVE READ, AND RECOMMEND TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH FOR ACCEPTANCE, A THESIS ENTITLED:

Estimating the Effects of Early Intervention with
Structural Equation Modeling

SUBMITTED BY: Mary A. Perry

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF HEALTH SERVICES ADMINISTRATION

Janet L. Storch
Dr. Janet L. Storch

Leslie Hayduk.
Dr. Leslie A. Hayduk

L. Laing
Dr. Lory M. Laing

Date: December 7, 1991

This thesis is dedicated to KERMIT and TINA,
for enabling me to be at home with
Steven, Jeffrey, and Ryan
for the duration of the project.

ABSTRACT

Evaluation of Early Intervention Programs for families with young handicapped children, is a complex and controversial endeavour. This paper describes an evaluation of the home-based Early Intervention Program, currently offered through Calgary Health Services. The focus of the evaluation was confined to estimating program impact over time, on family stress and coping. A longitudinal design (i.e. three measures over the period of one year) with Treatment, Pre-Treatment, and non-equivalent Control Groups was utilized. The study group was comprised of 156 parents (78 program parents and 78 control parents). The Family Stress and Coping Questionnaire used, was designed specifically for this investigation. The primary method of data analysis was structural equation modeling with LISREL. In total, 20 structural equation models of program impact were estimated; these models encompassed 22 different outcome variables. The analysis revealed the program had significant effects on 6 outcome variables (1 effect was unintended), non-significant effects on 13 outcome variables, and undetermined effects on 3 outcome variables. Limitations of the research design and causal modeling were fully discussed; recommendations were provided.

Special thanks to the Calgary Health Services
Early Intervention Program,
for their patience and cooperation with this process.

TABLE OF CONTENTS

INTRODUCTION.. 1

CHAPTER I: THE RESEARCH PROBLEM

A. Statement of Purpose........................ 3

B. Description of the Program under Evaluation 3

C. Variables.................................. 4

D. Operational Definition of Terms............ 7

E. Hypotheses Tested.......................... 9

F. Assumptions and Delimitations.............. 9

CHAPTER II: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

A. Literature Review.......................... 10
    A Primer on Health Care Evaluation... 10
    All About Early Intervention......... 26
    Theoretical Foundation for the Research Instrument................ 43
    Structural Equation Modeling with LISREL........................ 51

B. Conceptual Framework....................... 77
    Model A.............................. 77
    Model B.............................. 80
    Model C.............................. 82
    Model D.............................. 85
    Model E.............................. 87
    Model F.............................. 89

CHAPTER III: METHODOLOGY

A. Research Design............................ 92

B. Sampling Methodology....................... 92
    Treatment Group...................... 92
    Pre-Treatment Group.................. 93
    Control Group........................ 93

C. Protection of Human Rights.................. 94
    Treatment Group.................... 94
    Pre-Treatment Group.................. 95
    Control Group...................... 97

D. Procedure for Data Collection.............. 98

E. Instrumentation..............................100

F. Statistical Analysis.........................102

G. Limitations of the Design and Methodology..103

CHAPTER IV: RESULTS AND DISCUSSION

A. Presentation of Descriptive and
    Qualitative Data..........................109
        Response Rates........................109
        Qualitative Data......................112
        Descriptive Statistics................112

B. Interpretation of Qualitative and
    Descriptive Data..........................164
        Analysis of Response Rates............164
        Analysis of Qualitative Data..........165
        Analysis of Descriptive Data..........169

C. Presentation and Interpretation of
    Quantitative Data.........................183
        Pearson Correlations..................183
        Analysis of Pearson Correlations......184
        Analysis of the LISREL Structural
            Equation Models...................187

D. Discussion...................................267
        The Statistically Significant
            Program Impacts...................268
        The Statistically Non-Significant
            Program Impacts...................272
        The Indirect Program Impacts..........273
        Summary of Results and Findings.......276

CHAPTER V: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. Overview of the Study........................277

B. Significance of the Study....................280

C. Recommendations..............................281

REFERENCES..283

BIBLIOGRAPHY..303

APPENDIX I: Description of the Early Intervention Program...................................305

APPENDIX II: Family Stress and Coping Questionnaire Program Groups..........................318

APPENDIX III: Family Stress and Coping Questionnaire Control Group..........................322

APPENDIX IV: Matrix Equations for Model A..........324

APPENDIX V: Matrix Equations for Model B...........325

APPENDIX VI: Matrix Equations for Model C..........326

APPENDIX VII: Matrix Equations for Model D.........327

APPENDIX VIII: Matrix Equations for Model E........328

APPENDIX IX: Matrix Equations for Model F..........329

APPENDIX X: Sampling of Calgary Day Care Centers...330

APPENDIX XI: University of Alberta Ethics Approval Form...........................332

APPENDIX XII: Introductory Letter to Treatment Group Families -- Time I.............333

APPENDIX XIII: Research Consent Form...............334

APPENDIX XIV: Introductory Letter to Pre-Treatment Group Families........................335

APPENDIX XV: Introductory Letter to Control Group Families -- Time I...................336

APPENDIX XVI: Introductory Letter to Treatment Group Families -- Time II............337

APPENDIX XVII: Introductory Letter to Treatment Group Families -- Time III..........338

APPENDIX XVIII: Introductory Letter to Control Group Families -- Time II..........339

APPENDIX XIX: Introductory Letter to Control Group Families -- Time III................340

APPENDIX XX: Results of the Control Group Sampling Methodology..........................341

APPENDIX XXI: Abridged Comments from Program Families..............................343

APPENDIX XXII: Abridged Comments from Program Families............................351

APPENDIX XXIII: Abridged Comments from Program Families...........................354

APPENDIX XXIV: Abridged Comments from Program Families............................363

APPENDIX XXV: Data File for Longitudinal Models....368

APPENDIX XXVI: Data File for Cross-Sectional Models................................402

APPENDIX XXVII: Command Files for Model A1P........425

APPENDIX XXVIII: Command Files for Model A2P.......426

APPENDIX XXIX: Command Files for Model A3P.........427

APPENDIX XXX: Command Files for Model A1T..........428

APPENDIX XXXI: Command Files for Model A2T/A4T.....429

APPENDIX XXXII: Command Files for Model A3T/A5T....430

APPENDIX XXXIII: Command Files for Model B1P.......431

APPENDIX XXXIV: Command Files for Model B1T........432

APPENDIX XXXV: Command Files for Model C2P.........433

APPENDIX XXXVI: Command Files for Model C3P........434

APPENDIX XXXVII: Command Files for Model C4P.......435

APPENDIX XXXVIII: Command Files for Model C1P/C5P..436

APPENDIX XXXIX: Command Files for Model C1T........437

APPENDIX XL: Command Files for Model C4T...........438

APPENDIX XLI: Command Files for Model C3T/C6T......439

APPENDIX XLII: Command Files for Model C2T/C7T.... 440

APPENDIX XLIII: Command Files for Model D1P........441

APPENDIX XLIV: Command Files for Model E1P/E2P.....442

APPENDIX XLV: Command Files for Model F1P/F3P......443

APPENDIX XLVI: Command Files for Model F1T/F3T.....444

APPENDIX XLVII: LISREL Output for Best Model (C2P)..............................445

LIST OF TABLES

TABLE 1. Mean Scores for Perception of Handicap....125

TABLE 2. Mean Age at Entry to the Early Intervention Program....127

TABLE 3. Mean Time in Early Intervention at Data Collection....128

TABLE 4. Mean Scores for Satisfaction with Child Progress....129

TABLE 5. Mean Frequency of Happy Parent-Child Interactions....130

TABLE 6. Mean Number of Other Family Programs and Services....128

TABLE 7. Mean Scores for Level of Family Stress....139

TABLE 8. Mean Scores for Perception of Control or Mastery....140

TABLE 9. Mean Scores for Mutuality of Family Roles....141

TABLE 10. Mean Scores for Financial Security....142

TABLE 11. Mean Scores for Confidence with Problem-Solving....143

TABLE 12. Mean Scores for Ability to Reframe Problems....144

TABLE 13. Mean Scores for Escape / Avoidance of Problems....145

TABLE 14. Mean Scores for Escape / Reliance on God....146

TABLE 15. Mean Scores for Use of Alcohol / Avoidance of Problems....147

TABLE 16. Mean Scores for Use of Informal Supports....148

TABLE 17. Mean Scores for Use of Formal Supports...149

TABLE 18. Mean Scores for Positive Psychological Well-Being I..............................150

TABLE 19. Mean Scores for Positive Psychological Well-Being II.............................151

TABLE 20. Mean Scores for Negative Psychological Well-Being I..............................152

TABLE 21. Mean Scores for Negative Psychological Well-Being II.............................153

TABLE 22. Mean Scores for Parental Physical Health.....................................154

TABLE 23. Mean Scores for Reinforcement from Child......................................155

TABLE 24. Mean Scores for Acceptability of Child...156

TABLE 25. Mean Scores for Demandingness of Child...157

TABLE 26. Mean Scores for Competence in Parenting Role.......................................158

TABLE 27. Mean Scores for Parent-Child Attachment.................................159

TABLE 28. Mean Scores for Restrictiveness of Parenting Role..........................160

TABLE 29. Mean Scores for Depression about Child...161

TABLE 30. Mean Scores for Marital Conflict about Child....................................162

TABLE 31. Mean Scores for Social Isolation in Parenting Role..........................163

TABLE 32. Pearson Correlations.....................186

TABLE 33. Covariance Matrix for Model A1P..........196

TABLE 34. Covariance Matrix for Model A2P..........196

TABLE 35. Covariance Matrix for Model A3P..........197

TABLE 36. Covariance Matrix for Model A1T..........197

TABLE 37. Covariance Matrix for Model A2T/A4T......198

TABLE 38. Covariance Matrix for Model A3T/A5T......198

TABLE 39. Maximum Likelihood Estimates for Model A1P......................................199

TABLE 40. Maximum Likelihood Estimates for Model A2P......................................200

TABLE 41. Maximum Likelihood Estimates for Model A3P......................................201

TABLE 42. Maximum Likelihood Estimates for Model A1T......................................202

TABLE 43. Maximum Likelihood Estimates for Model A2T/A4T..................................203

TABLE 44. Maximum Likelihood Estimates for Model A3T/A5T..................................204

TABLE 45. Covariance Matrix for Model B1P..........215

TABLE 46. Covariance Matrix for Model B1T..........215

TABLE 47. Maximum Likelihood Estimates for Model B1P......................................216

TABLE 48. Maximum Likelihood Estimates for Model B1T......................................217

TABLE 49. Covariance Matrix for Model C2P..........223

TABLE 50. Covariance Matrix for Model C3P..........223

TABLE 51. Covariance Matrix for Model C4P..........224

TABLE 52. Covariance Matrix for Model C1P/C5P......224

TABLE 53. Covariance Matrix for Model C1T..........225

TABLE 54. Covariance Matrix for Model C4T..........225

TABLE 55. Covariance Matrix for Model C3T/C6T......226

TABLE 56. Covariance Matrix for Model C2T/C7T......226

TABLE 57. Maximum Likelihood Estimates for Model C2P.....................................227

TABLE 58. Maximum Likelihood Estimates for Model C3P.....................................228

TABLE 59. Maximum Likelihood Estimates for Model C4P.....................................229

TABLE 60. Maximum Likelihood Estimates for Model C1P/C5P.................................230

TABLE 61. Maximum Likelihood Estimates for Model C1T.....................................231

TABLE 62. Maximum Likelihood Estimates for Model C4T.....................................232

TABLE 63. Maximum Likelihood Estimates for Model C3T/C6T.................................233

TABLE 64. Maximum Likelihood Estimates for Model C2T/C7T.................................234

TABLE 65. Covariance Matrix for Model D1P.........246

TABLE 66. Maximum Likelihood Estimates for Model D1P.....................................247

TABLE 67. Covariance Matrix for Model E1P/E2P.....246

TABLE 68. Maximum Likelihood Estimates for Model E1P/E2P.................................251

TABLE 69. Covariance Matrix for Model F1P/F3P.....257

TABLE 70. Covariance Matrix for Model F1T/F3T.....258

TABLE 71. Maximum Likelihood Estimates for Model F1P/F3P.................................259

TABLE 72. Maximum Likelihood Estimates for Model F1T/F3T.................................260

LIST OF FIGURES

FIGURE 1. Concepts and Variables for Causal Modeling 5

FIGURE 2. Summary of the General Structural Equation Model 64

FIGURE 3. Conceptual Model A 79

FIGURE 4. Conceptual Model B 81

FIGURE 5. Conceptual Model C 84

FIGURE 6. Conceptual Model D 86

FIGURE 7. Conceptual Model E 88

FIGURE 8. Conceptual Model F 90

FIGURE 9. Standardized Effects for Model A1P 205

FIGURE 10. Standardized Effects for Model A2P 206

FIGURE 11. Standardized Effects for Model A3P 207

FIGURE 12. Standardized Effects for Model A1T 208

FIGURE 13. Standardized Effects for Model A2T/A4T ..209

FIGURE 14. Standardized Effects for Model A3T/A5T ..210

FIGURE 15. Standardized Effects for Model B1P 218

FIGURE 16. Standardized Effects for Model B1T 219

FIGURE 17. Standardized Effects for Model C2P 235

FIGURE 18. Standardized Effects for Model C3P 236

FIGURE 19. Standardized Effects for Model C4P 237

FIGURE 20. Standardized Effects for Model C1P/C5P ..238

FIGURE 21. Standardized Effects for Model C1T 239

FIGURE 22. Standardized Effects for Model C4T 240

FIGURE 23. Standardized Effects for Model C3T/C6T..241

FIGURE 24. Standardized Effects for Model C2T/C7T..242

FIGURE 25. Standardized Effects for Model D1P......248

FIGURE 26. Standardized Effects for Model E1P/E2P..252

FIGURE 27. Standardized Effects for Model F1P/F3P..261

FIGURE 28. Standardized Effects for Model F1T/F3T..262

INTRODUCTION

Early Intervention Programs are one of many forms of health care, education, and social services intended to facilitate development in high-risk, delayed, or handicapped infants and young children. Currently in Canada there are over 130 Early Intervention Programs employing over 400 staff. Major philosophical, social, political, and legal forces have contributed to the rapid and wide-spread diffusion of these programs across North America (Brynelsen & Cummings, 1987), yet at this time there is only modest quantitative evidence supporting the effectiveness of Early Intervention Programs (Halpern, 1984).

Alberta Health funds the Provincial Early Intervention Program (there are also similar private, school-based, and hospital-based programs operating throughout Alberta). There are fourteen community health centers offering home-based service to families with children under 3 1/2 years of age who have developmental delay, mental handicap (e.g. Down Syndrome, Fetal Alcohol Syndrome), neurologic handicap (e.g. Cerebral Palsy, Spina Bifida), multiple handicaps, hearing impairment, or vision impairment. Participation in the program is voluntary with no direct cost to families.

The purpose of this document is to present a description of the home-based Early Intervention Program offered through Calgary Health Services, and an evaluation of this program's impact on family stress and coping with a young handicapped child. Investigation of this particular outcome was requested by the program staff, and the need for evaluative research in the area is well supported by the literature (Bickman & Weatherford, 1986).

CHAPTER I: THE RESEARCH PROBLEM

Statement of Purpose

The primary purpose for this study was to answer the question: "What is the magnitude of impact from the Early Intervention Program on family stress and coping with a young handicapped child?" Secondary but related questions this study attempted to answer were: "What are the specific mechanisms by which Early Intervention works to reduce family stress and enhance coping?" and "Is there a differential impact of Early Intervention on fathers versus mothers, and families of children with Down Syndrome versus Developmental Delay?"

Description of the Program Under Evaluation

Please refer to Appendix I for a detailed description of Calgary's Early Intervention Program. This section includes the program philosophy, aims, history, administration, criteria for referral and admission, criteria for discharge, methods of implementation, implicit causal hypotheses of staff, and further justification for the focus of this evaluation study.

Variables

Please refer to Figure 1 for a summary of the concepts and variables available for causal modeling. There are several exogenous concepts or independent variables that potentially impact family stress and coping with a young handicapped child: age and sex of parent; age and sex of child; number of other young children in the home; child care arrangements; marital status of parents; family culture and religious conviction; parents' level of education and employment status; involvement with the Early Intervention Program; age of child at first referral to the Early Intervention Program; length of time in the Early Intervention Program; type and severity of child's handicap; and involvement of other child / family programs.

For the initial attempts at data analysis and structural equation modeling the priority concepts were: involvement with the Early Intervention Program; age of child at first referral to the Early Intervention Program; and length of time in the Early Intervention Program. These are independent variables

Figure 1. Concepts and Variables* for Causal Modeling

*The number in brackets is the actual variable measured and corresponds to the questionnaire item.

Exogenous Concepts	Intervening Concepts	Endogenous Concepts
Age of Child/Parent (I)	Stress on Family (II-1)	Parent's Health (III-1)
Sex of Child/Parent (I)	Control or Mastery (II-2)	Parent Reinforcement (III-2)
Other Young Children (I)	Mutuality of Roles (II-3)	Acceptablility of Child (III-3)
Day Care Arrangements (I)	Financial Security (II-4)	Demandingness of Child (III-4)
Marital Status (I)	Problem-Solving (II-5a)	Feeling of Competence (III-5)
Family Culture (I)	Reframing (II-5b)	Feeling of Attachment (III-6)
Religious Conviction (I)	Avoidance (II-5c,e)	Restrictiveness of Role (III-7)
Employment Status (I)	Passivity (II-5d)	Depression about Child (III-8)
Level of Education (I)	Informal Supports (II-5f)	Marital Conflict (III-9)
Severity of Handicap (I)	Formal Supports (II-5g)	Social Isolation (III-10)
Type of Handicap (IV)	Pos. Well-Being (II-6a,b)	Positive Experiences (IV)
E.I.P. (IV)	Neg. Well-Being (II-6c,d)	
Age of Enrollment (IV)	Progress in E.I.P. (IV)	
Total Time in E.I.P. (IV)		
Other Social Services (IV)		

because there is no attempt to explain their cause or origin, i.e. the intent was only to measure their effect on other concepts and variables.

There are several intervening concepts or variables that potentially mediate the stress a family experiences with a handicapped child: overall emotional stress on the family; parents' perception of control or mastery; mutuality of roles in the family; financial security; parents' confidence in problem-solving ability; parents' ability to reframe problems; parents' passivity with problems; availability of informal supports; availability of formal supports; parents' psychological well-being; parents' perception of child's progress in the Early Intervention Program. For purposes of this investigation, the most important intervening variables were those the Early Intervention Program strives to manipulate. The literature and interviews with program staff suggested that program impact occurs primarily through increasing the availability of informal and formal supports to the family, strengthening psychological well-being of parents, and decreasing frustration and overall stress on the family unit.

The endogenous concepts or dependent variables focus on stress in the parent-child relationship. Several indicators of parenting stress were measured: parent reinforcement from child; acceptability of child to parent; parents' perceived demandingness of child; marital conflict over child; parents' feelings of social isolation; physical health of parent; and frequency of positive parent-child experiences. For the initial attempts at structural equation modeling the priority dependent variables were parent depression, isolation, competence, and attachment, since these are the major outcomes the program claims to impact.

Operational Definition of Terms

Magnitude of Impact - the structural coefficients derived from the LISREL analysis.

Early Intervention Program - the unique and individualized service each family receives from the staff of Calgary Health Services Early Intervention Program.

Family - at least one parent (natural or surrogate) and the child enrolled in the Early Intervention Program. The broader term "family" was used in the problem statement because some of the questions asked of the parents referred to the total family unit and its structure / function.

Stress or Parenting Stress - this term encompasses the dependent variables under investigation. These variables were not combined into a total score, but rather analyzed as concepts in their own right. The use of the generic term "stress" is for ease of communication.

Coping - this term encompasses the intervening concepts or variables that mediate family stress. It refers to a variety of specific coping mechanisms, family strengths, and parent psychological states. These measures were not summed but analyzed as concepts in their own right. The use of the generic term "coping" is for simplicity and ease of communication.

Young Handicapped Child - the child (newborn to 3 1/2 years of age) enrolled in the Early Intervention

Program. The term has the same meaning as "special needs child" or "child with developmental delay".

Hypotheses Tested

H0: There is no significant impact from the Early Intervention Program on family stress and / or coping with a young handicapped child.

H1: There is a significant positive impact from the Early Intervention Program on family stress and / or coping with a young handicapped child.

H2: There is a significant negative impact from the Early Intervention Program on family stress and / or coping with a young handicapped child.

H3: There are both positive and negative impacts from the Early Intervention Program on family stress and / or coping with a young handicapped child, but they cancel each other resulting in no net impact.

Assumptions and Delimitations

There were two implicit assumptions in conducting this study:

a) The Family Stress and Coping Questionnaire was a valid, reasonable, and reliable instrument. It was derived from four well-established tools specifically for this investigation, but this instrument has not been tested by traditional methods.

b) Parents' responses to the Family Stress and Coping Questionnaire reflected their honest thoughts and feelings.

There were two obvious delimitations to this study:

a) Specific aspects of parenting stress, coping, family strengths, and psychological well-being were used in this investigation. Failure to detect program impacts may result from the limited selection of outcome criteria.

b) This was not a comprehensive program evaluation, therefore the results cannot be used in isolation to decide the fate of the Early Intervention Program.

CHAPTER II: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Literature Review

There is an extensive body of literature relevant to this study and the conceptual framework, i.e. health care program evaluation, early intervention programs for families of handicapped children, parent stress and coping, and structural equation modeling with LISREL.

A Primer on Health Care Evaluation

The Need for Health Care Evaluation

The increasing complexity and cost of health care programs and technologies have stimulated attempts at evaluation by multi-disciplinary clinicians, epidemiologists, demographers, statisticians, economists, sociologists, operations researchers, political scientists, administrators, and consumers. Despite the flurry of activity in health care evaluation, new programs and technologies are often introduced and disseminated throughout the system without rigorous research into their safety and effectiveness.

Currently the benefit of medical / health care is being questioned in a most fundamental way. Can we objectively prove a health care intervention or program clearly results in greater good than harm? To what extent does the placebo effect (i.e. the idea you are having something beneficial done, makes you believe you are getting better) account for positive program outcomes? To what extent does the Hawthorne effect (i.e. the process of discussing, documenting, and monitoring what is happening to you, has a beneficial effect) account for positive program outcomes? Will monies spent on more health / medical care result in improved health status -- or would they be better spent on improved housing, nutrition, incomes, education, and environmental safety, which also impact health status (Lerner, 1977)? It is important to prove that what we do makes a difference -- it is a waste to do efficiently that which should not be done at all.

Many authorities believe it is not the price of medical progress per se, but rather the spiralling cost of ineffective, superfluous, unproven, and unsafe health care technologies that we cannot afford. If we are to preserve universal accessibility to quality health care and simultaneously control costs, then we must ensure resources are used responsibly to the maximum patient benefit. Health services with marginal value must be discarded to create capacity for services that are proven effective. "We are [potentially] spending billions on technology we do not need, and can't afford the technologies we do need" (Relman, 1982).

The Politics of Evaluation

"Evaluation is a rational enterprise that takes place in a political context" (Weiss, 1975). Much of the literature on issues in evaluation focuses on the political nature of the process, and the impact of this political process on the utilization of evaluation results (Gurel, 1975; Sjoberg, 1975; Tornatzky & Johnson, 1982; Davis & Salasin, 1975; Beyer & Trice, 1982; Poland, 1974; Weikel, Yordy, & Goldman, 1971; Twain, 1975; Rog & Bickman, 1984). Weiss goes on to claim that recognition of the political constraints and resistance to an evaluation project, is a precondition to useable evaluation research.

The potential value of evaluation research for internal management control and external accountability is well recognized, but the actual usefulness for decision-making purposes is often unclear. An evaluation study may not be used by its recipients for a number of reasons: the study was perceived to be poorly designed yielding unreliable and invalid results; sample was not representative; results were received at an inopportune time; recommendations for resolving organizational problems were not provided; no exploration of costs / benefits of various recommendations; study did not answer questions of importance; study did not provide enough information on which to base a change in policy; mathematics and language were too complex for general understanding; the evaluation process and final recommendations were insensitive to the political / power realities within the organization; evaluator did not include the organization or program in the planning and implementation of the study; or the evaluator was perceived to be unfairly biased toward or against one stakeholder (e.g. management, staff, clients, government, etc.) (Strasser, Steinberg, Cummins, & Persels, 1983).

Evaluation requires time, resources (human, fiscal, and materiel), and expertise. An organization or program may be unwilling or unable to commit these in sufficient quantity for the following reasons: it is felt the worth of the program is obvious or has already been adequately proven, therefore the evaluation is unnecessary; the resources required to conduct a meaningful evaluation would compete with the scarce resources available for program development and actual intervention (i.e. "it is better to have an adequately funded and staffed program, than to evaluate a set of activities which by virtue of lack of funding are inadequate"); or important decisions about program policy, funding, and implementation have already been made, and evaluation results would not change the predetermined course of action (Wagner & Guild, 1989).

No matter how strongly one may want to undertake a carefully controlled evaluation effort in a given program, there are usually limitations on resources and opportunities. The task becomes one of optimizing the amount and quality of information that can be obtained within the limits of available resources.

Program Evaluation Strategies

There are several classic texts in evaluation that broadly outline trends, key concepts, and types of designs common in health care and social services research (Veney & Kaluzny, 1984; Suchman, 1967; Wortman, 1981; Weiss, 1972; Shortell & Richardson, 1978; Franklin & Thrasher, 1976; Palmer, 1983; Rossi & Freeman, 1985; Guttentag & Struening, 1975; Herman, Morris & Fitz-Gibbon, 1987).

Approaches to evaluating health care have been characterized by Donabedian as structural, process, or outcome (Donabedian, 1966, 1985). Structural approaches involve evaluation of the setting and available resources. Included would be such factors as the physical aspects of a facility, qualifications of health professionals, and characterisitics of the administrative and clinical components. Process evaluations typically involve evaluation of the activities of physicians and other health professionals, in the management of patients. Normative standards are derived, explicitly or implicitly, against which empirical practice is compared. Outcome approaches attempt to evaluate results in terms of effect on health status and patient satisfaction.

Prior to the 1960's medical / health care evaluations were primarily outcome oriented, using easily measured criteria such as mortality rates, infection rates, and incidence of surgery. During the 1960's and early 1970's there was a shift toward process studies, apparently because of the difficulties in measuring small changes in health status that were the result of health care interventions (Brook, Davis-Avery, et al, 1977). There was great debate in the 1970's about the relationship between process and outcome criteria, and the value of process evaluation without linkage to outcomes (McAulliffe, 1978; Kane, Gardner, et al, 1977; Brook, 1979; McAulliffe, 1979). There was growing recognition that improved process did not necessarily result in better outcomes, and evaluators at this time struggled with integrating the two approaches (Williamson, 1971; Brook & Stevenson, 1970; Brook, Appel, Avery, Orman, & Stevenson, 1971; Brook, Berg, & Schecter, 1973; Starfield & Scheff, 1972; Christoffel & Loewenthal, 1977). Throughout this time there was also considerable progress in the development of health status indices and profiles, making process-outcome linkages more feasible (Eisen, Ware, Donald, & Brook, 1979; Gilson, Gilson, et al, 1975; Schach & Starfield, 1973; Fanshel & Bush, 1970; Sackett, Chambers, et al, 1977; Starfield, 1974; Breslow, 1989). During the 1980's there was a swing in preference back to outcome based research among scientific evaluators, while accreditors and quality assurance auditors continued in the study of health care structure and process (Rennebohm & O'Brien, 1989).

It is often said the demand for "good" health care evaluators far outreaches the available supply, but this is partly because there is little concensus on how to educate evaluators (Boudreau, Last, Poole, & Sackett, 1973; Bashin, Levesque, MacPherson, & Poole, 1980). To accomodate the different philosophic orientations in health care (clinical, academic, epidemiologic, sociologic, management, economic, etc.), an evaluator is expected to have a broad knowledge base and show expertise with a wide variety of specialized techniques. For example, academic medicine considers the randomized clinical trial the gold-standard in evaluation (Wales, Kane, Robbins, Bernstein, & Krasnow, 1983; Christie, 1979; Russell, Devlin, Fell, Glass, & Newell, 1977; Sachett, Spitzer, Gent, & Roberts, 1974). Some argue that randomized trials are not appropriate in all clinical situations, and for financial, ethical, or practical reasons a quasi-experimental design (e.g. regression discontinuity analysis, before-and-after study, multiple time series design, cross sectional comparison, etc.) may be the only feasible alternative (Cubbon, 1987; Bonchek, 1979; Guyatt, Drummond, Feeny, Haynes, & Tugwell, 1986). Epidemiologists favour case studies, cohort and case control designs, longitudinal research, and correlational studies (Sanderson, Svanstrom, & Eriksson, 1988; Hennekens & Buring, 1987; Rhoads, 1986; Roos, Nicol, & Cageorge, 1987). Economists advocate cost-effectiveness and cost-utility studies (Drummond, Stoddart, & Torrance, 1987; Chance, 1988; Hellinger, 1989; Torrance, Thomas, & Sachett, 1972; Feeny & Torrance, 1989; Kaplan & Bush, 1982; Levin, 1975; Higgins, 1986). Management scientists opt

for systems analyses and operations research including utilization studies, market share analyses, decision analyses, mathematical modeling and computer simulations, needs assessments, forecasts and trend analyses (Austin & Burns, 1985). The philosophic approach an evaluator chooses depends upon the evaluation question that needs to be answered, e.g. "Is this program effective?" versus "Should money be allocated to Program A or Program B?" versus "How do we best implement this program?"

Depending upon the operational idiosyncrasies of a particular program, evaluators will also need to be familiar with other specialized health care evaluation strategies: tracer methodologies (Burdette, Babineau, Mayo, Hulka, & Cassel, 1974; Dutton & Silber, 1980; Kessner, Kalk, & Singer, 1973; Novick, Dickinson, Asnes, Maylan, & Lowenstein, 1976); criteria mapping (Greenfield, Kaplan, Goldberg, Nadler, & Deigh-Hewertson, 1978; Greenfield, Lewis, Kaplan, & Davidson, 1975); disease staging (McCord, Cattani, & Louis, 1976; Day, Williams, & Khaw, 1989; Gonnella, Hornbrook, & Louis, 1984; Gonnella, Louis, & McCord, 1976); goal attainment scaling (Kiresuk & Sherman, 1968); health accounting (Williamson, 1978; Williamson, Aronovitch, Simonson, Ramirez, & Kelly, 1975); meta-analysis (Pillemer & Light, 1980); random chart audits (Lieberman, 1974; Osborne & Thompson, 1975); criteria-based evaluation (Thompson & Osborne, 1974, 1976; Rubenstein, Mates, & Sidel, 1977; Donabedian, 1981; Mates & Sidel, 1981; Romm & Hulka, 1979; Palmer & Nesson, 1982; Wagner, Greenberg, et al, 1976; Gonnella, Goran, Williamson, & Cotsonas, 1970); patient satisfaction surveys (Pascoe & Attkisson, 1983; Ware, Snyder, Wright, & Davies, 1983; Lebow, 1974, 1983; Mushlin & Appel, 1980); qualitative methodologies (Rooks, Weatherby, et al, 1989; Tymstra, Heyink, et al, 1988; Goodwin & Goodwin, 1984); objectives based evaluation (Hirschorn, Lamstein, Klein, McCormick, & Warner, 1978); the trajectory method (Zuckerman, Huntley, & Waterbrook, 1980); regression analysis (Romm, Hulka, & Mayo, 1976); and the component oriented approach (Graham & Birchmore-Timney, 1989). Different evaluation strategies have value in different practice settings; the challenge is to undertake the research method that yields the most useful information for the particular program.

Future Directions for Health Care Evaluation

There are many reasons to expect continued growth in the field of health care evaluation. Health care sponsors, policy-makers, planners, providers, and consumers are increasingly skeptical of common sense, good will, and conventional wisdom as the basis for expensive and risky programs. The development and cost of technologies are outpacing the rate of health care funding, and resources are increasingly scarce. Evaluation offers a systematic, rational way to make decisions about resource allocation.

In the future, health care evaluation will need to move forward in several directions (Lohr, 1988). Program evaluations of both a process-oriented and outcome-oriented nature will continue to grow, but there needs to be even greater attempts at linkage between the two approaches. We need research methodologies (both design and statistical) that enable demonstration of cause and effect relationships. Unless it is clear which components of a program are producing the results, it will be difficult to implement effective change to improve program outcomes. There needs to be continued development of general health status indicators, and improved sensitivity, reliability, and validity of program-specific outcome measures.

Health services research needs a macro model that sets a standard and unites the various approaches used in technology assessment, program evaluation, and quality assurance. Without an integrated flow of information about needs, efficacy, effectiveness, efficiency, cost, utilization, and quality, comprehensive program evaluation will be difficult and recommendations for alternative strategies will continue to be ignored (Brook & Lohr, 1985). The Technology Assessment Iterative Loop developed by Tugwell, Bennett, Sackett, and Haynes (1985), is an excellent framework for organizing health services data, however it is not widely known and accepted. The TAIL (or any other evaluation model) does not provide practical criteria for deciding whether and to what extent a health care practice should be evaluated.

Currently there are strong incentives to develop new treatments and technologies, and disseminate them quickly. At the same time there are disincentives to conducting sound research to properly evaluate these technologies. Health services research is expensive and time-consuming, requires extensive multi-discplinary collaboration, is often ethically and logistically complex, and carries little personal glory (Relman, 1980). To restructure the current system of incentives Bunker, Fowles, and Schaffarzick (1982), suggest selective coverage of "experimental" health care services, and tying reimbursement to evaluation, i.e. only proven therapies would be in physician / facility fee schedules, and everything else is subjected to a program cap until full evaluation is completed. These same authors also propose a national institute for health care evaluation to generate and disseminate high quality research. Fineberg & Hiatt (1979) suggest a committment of one percent of the total health care expenditure is needed to establish an adequate financial base for evaluation research. Unless evaluation is considered a routine and integral part of the cost of providing care, it will be forced to compete in the existing hierarchy of biomedical and health services research needs.

Critical to the future is the education of health professionals from all disciplines, in the principles of sound evaluation. Only then will we have the expertise, common language, and understanding of issues necessary for evaluation to be a high priority in everyone's practice.

All About Early Intervention

Families with Handicapped Children

The birth of a child, even a healthy child, brings a multitude of changes, challenges, and stresses to any family (Entwisle & Doering, 1981). Prior to the birth all family members have expectations, anxieties, and excitement about the impending event. With the arrival of the new baby comes a role change and depth of emotional response that is unparalleled with many other stages of the lifecycle. Parents often experience the entire spectrum of feelings -- joy, sadness, frustration, fear, relief, love, exhaustion, accomplishment, and uncertainty.

Given adequate preparation, resources, and support, most families manage to adapt to a new baby within the early months and years. Family roles and responsibilities become established and the child is incorporated into the family whole. However when a child is born with a disability or at significant risk for developmental difficulties, the adjustments may be more pronounced and prolonged (Hanson & Lynch, 1989).

Children requiring special health care, education, and social services, cannot be viewed outside the context of their families. Infants are born into families and no two families are alike. Families vary in composition, size, strengths, and values, but regardless of these differences families serve similar functions across societies. The family unit has always been the primary agency for helping a new member survive; learn societal roles and tasks; understand love, belonging, and responsibility; and eventually become a person capable of transmitting basic human competencies to the next generation. It is the family that teaches children to communicate, to understand sexual differences, to play with others, and generally to conform to the mores of the cultural group. A young child's development is the product of his constant interaction with the environment -- primarily the home environment. Parents of disabled children require enormous amounts of physical and psychic energy to foster this developmental process; these children require more of everything, and those who take parenting seriously give it to them (Fewell, 1986).

A disabled child has a significant impact on every family member -- parents, siblings, grandparents, and extended family relations (Gobel & Kotsch, 1981; Gallagher, Cross, & Scharfman, 1981; Breslau, Staruch, & Mortimer, 1982). The birth and / or initial diagnosis of a handicapped child brings an acute family crisis with feelings of isolation, guilt, intense disappointment, confusion, and anger. Sometimes there is conflict and indecision about keeping the child in the home environment. Often family members are at different levels of acknowledgement and acceptance -- some experiencing denial while others are deeply worried about the future. The grief, stress, and crises are not over once the family has accepted the diagnosis -- they recur chronically throughout the child's lifespan. The adaptive steps of denial, anger, bargaining, depression, and acceptance simply do not occur once, but rather each time there is a painful reminder of the child's disability (Fewell & Vadasy, 1986; Seligman & Darling, 1989; Hanson & Hanline, 1990; Bailey & Simeonsson, 1988).

Although the emphasis is usually placed on helping the child and family at the time of diagnosis, chronic grief may require intermittent support throughout the lifespan. During infancy and early childhood families with a handicapped child often cope with difficult behaviours, decreased responsiveness, and prolonged dependency with respect to feeding, walking, toileting, etc. In addition to the normal developmental tasks of early childhood, disabled infants may be faced with frequent hospitalizations, invasive medical procedures, repeated separations from family, and exposure to large numbers of unfamiliar adults.

During the school years, families are usually forced to deal with the enormous task of finding appropriate special education services, and the issues of segregation and extra expense. At this time siblings may be feeling guilty, embarrassed, or resentful of their brother / sister's limitations; many feel compelled to overachieve to compensate for their parents' loss.

The adolescent years frequently bring rejection and isolation by a handicapped child's same-age peers, recognition that they are "different" or "special", and subsequent low self-esteem. By the time the child reaches eighteen years many family services and public education programs end. The handicapped person is assumed to have reached his / her potential for self-sufficiency, even though they may still be partially or wholly dependent on the family. Parents and siblings are faced with the troubling question of who will support and care for the handicapped member once the parents die (Fewell & Vadasy, 1986).

Research has indicated that a wide variety of factors may contribute to both the adaptation and stress experienced by families of disabled children (Singer & Irvin, 1989; Dunst, Trivette, Hamby, & Polloch, 1990; McCubbin, 1989; McLinden, 1990; Lazarus, 1985; McKinney & Peterson, 1987; Peterson, 1984; Wilfong & Abidin, 1986; Cobb, 1976; Friedrich, 1979; Beckman, 1983; Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983; Custer, 1985). These factors include: child characteristics such as age, prognosis, caregiving demands, and behavioural concerns; parent characteristics such as ability to cope with stress, perception of the cause and severity of the handicap, and attitudes about child development and the parenting role; and social characteristics such as availability of resources, marital status, family dynamics, culture and religion, and quality of informal and formal supports. Each family and child are unique in their reactions and coping abilities. Despite the increased stress experienced by families of handicapped children, many adapt in functional ways and appreciate the positive contributions made by the child (Kazak & Marvin, 1984; Summers, Behr, & Turnbull, 1989).

The Rationale for Early Intervention Programs

In the fall of 1986 the U.S. Congress passed Public Law 99-457 or The Education of the Handicapped Act. This landmark legislation made provision of early intervention services mandatory and universally available to families of handicapped children, regardless of their geographic location or financial resources. The law was the impetus for the widespread diffusion of early intervention programs throughout the U.S. While Canada did not have parallel legislation, early intervention programs proliferated out of similar philosophies and humanitarian concern for families of handicapped children (Brynelsen & Cummings, 1987).

The term "early intervention" means very different things to different people. For example, early intervention services provided in the past ranged from spinning a child with cerebral palsy in a chair for a few seconds each day (to achieve vestibular nerve stimulation), to forty hours per week of multi-disciplinary efforts that began at birth and lasted until kindergarten. The term encompasses home-based visits that utilize parents as the primary interveners, medically oriented intervention in neonatal intensive care units, professional consultation services in child day care centers, education oriented center-based programs, and even personal support systems such as volunteer grandparents. The diversity of activities and services that have been included under the umbrella of early intervention is staggering.

There are few commonalities or standards among early intervention programs with respect to child's eligibility for service, mode of delivery, instructional strategies, curricular focus, family assessment and involvement, education and deployment of staff, and methods of program evaluation. Yet almost everyone in the education and rehabilitation fields believes that early intervention is effective and ultimately saves money. Furthermore they agree that the earlier the programs are initiated, and the more comprehensive and intensive the service, the greater the benefits are to children and families (White & Casto, 1989).

The rationale for early intervention is based on four key arguments (Bricker, 1986):

1) Early intervention programs maximize infant / child developmental outcomes. Without persistent and systematic attempts at interaction and education, many handicapped infants will not acquire even simple sensori-motor behaviours albeit more complex responses. The absence or delay of early, basic skills (e.g. reaching, exploring, sitting, etc.) have a cumulative effect over time, and there is an ever increasing gap between expected and actual development.

2) Early intervention programs prevent the development of secondary disabilities. Many handicapped children are inclined to develop undesireable behaviours (e.g. arching, head-banging, thrashing, etc.), or fail to respond in a manner that is satisfying and reinforcing for the caregiver. Parents and families can attenuate or inhibit the development of secondary behaviours if provided the necessary information and instruction on handling techniques. While a synchronous response comes naturally to healthy mother-infant pairs, it must be learned if the baby's behaviour is erratic and unpredicatable. Over time an unrewarding interaction between parent and child leads to less frequent interaction and decreased attachment.

3) Early intervention programs provide support and information for families. The birth and rearing of a handicapped child is extremely stressful, and families need constructive help and support at the time of diagnosis and throughout the child's lifespan. Families are in the best position to maximize the child's learning potential, since most of his time is

spent in the home environment. Early intervention programs can assist families in obtaining other supports and servcies they may require (e.g. financial assistance, specialized child care, etc.).

4) Early intervention programs are cost-effective. The cost of operating an early intervention program is far less than the cost of residential / institutional care. With additional support most families are willing and capable of maintaining their handicapped child in the home and community. The specialized early education the child receives through an early intervention program, better enables him to enter the public education system by school-age. Children who have had early intervention services often require fewer special education services in the longterm. All these factors point to increased independence and learning capacity once the handicapped child reaches adulthood.

There are six arguments commonly made against public support of early intervention programs (adapted from Peterson, 1987):

1) Universally accessible programs for families of handicapped children are costly to operate and serve a small minority of the population.

2) Other programs should have a higher priority than early intervention, e.g. education of non-handicapped children, prevention and diagnosis of birth defects, support programs for handicapped adults.

3) Early intervention programs have not adequately proven their effectiveness, and should not be supported on a widescale basis until data are more conclusive. It is dangerous to assume "they do no harm and may do some good".

4) There is not sufficient evidence to suggest infancy and early childhood are the critical periods for intervention; education in later years may be just as valuable and effective.

5) Early intervention cannot help chilren regrow brain cells. Many children with handicaps and developmental delay will naturally progress at their own rate according to their potential, with or without (and perhaps inspite of) formal intervention. Families

would receive greater benefit from a formal babysitting or respite service.

6) Providing formal supports through universal early intervention encourages families to be dependent on social programs; they will be less inclined to develop their informal networks of support. This leads to parental disenchantment, feelings of helplessness and incompetence, external locus of control, and unhealthy relationships with service providers.

Evaluation of Early Intervention Programs

There have been hundreds of studies conducted to demonstrate the effectiveness of early intervention programs. Prior to Public Law 99-457 many of these investigations focused on the child's developmental progress. In recent years the aim of evaluation has shifted to documenting the impact on families and communities, and comparing different types of programs (see Bickman & Weatherford, 1986; Guralnick & Bennett, 1987; Bricker, 1986, for reviews of literature on efficacy).

There are several reasons for the apparent shift in research focus. With the growing body of literature on the role of the family and family systems theory, it became philosophically incongruent to make intervention programs and evaluations strictly child-focused. Secondly the measurement of child progress as a direct result of intervention, proved to be extremely difficult. Few programs were able to claim children were "cured" of handicaps, and standardized developmental instruments could not track small but progressive changes in the children. It was prudent to look for program outcomes that were more obvious and easier to measure. Finally the U.S. legislation mandating the availability of early intervention services took the pressure off programs "to prove their efficacy or face budget cuts". Evaluators could safely turn away from the question "Should this program be provided?" and focus on "How is this program best implemented?".

As with any multi-disciplinary program, the outcome criteria chosen for evaluation are biased toward the interests of whomever is conducting the evaluation (Tingey, 1989). When medical staff evaluate early intervention they tend to focus on the child's physical health. Psychologists are interested in achievement of developmental milestones. Physical and occupational therapists use motor function and self-care skills for outcome criteria; speech therapists use language ability and communication skills; social workers focus on family function and quality of the home environment; mental health specialists look at parental stress and coping abilities; teachers evaluate the child's progress toward individualized learning goals; and administrators focus on program costs, efficiency, and resource allocation. When parents evaluate early intervention they are interested in the program's impact on their daily routine, and the child's emotional response to the worker and the exercises. The community evaluates the early intervention program based on availability of the service, and impact on other agencies.

Evaluation of early intervention has been undertaken using a variety of "relevant" outcomes, but the results of all this research is mixed at best. Many interventionists hold that the value of early intervention is obvious and has been demonstrated; evaluation critics, even those philosophically disposed toward the benefits of early intervention, argue that the efficacy of these programs still awaits objective verification (Bricker, 1986). Few if any program has been able to impose the rigorous methodology necessary to control for confounding variables, and prove effectiveness.

Evaluation of an early intervention program may be conducted: to improve the delivery of services; to monitor the progress of families and children; to increase understanding of the effects of various types of intervention; and to provide information to government about the longterm effects of early intervention (Hanson & Lynch, 1989). Some early intervention professionals are skeptical about evaluation endeavours. They fear the study may be disruptive to program functioning, and discouraging / time-consuming for families (Tingey, 1989). Early intervention has its historical roots in the 1960's Head Start Program, a special education program for young children from impoverished homes. The evaluation of Head Start has been surrounded in controversy, and many from the early intervention field believe the criteria chosen for evaluation of effectiveness were inappropriate. They feel the "overly negative publicity" from this study endangered the field, and has made them wary about evaluators' abilities to find the real outcomes (Peterson, 1987).

Some of the evaluation problems discussed in the early intervenion literature include: poor causal modeling of program impacts; lack of agreement on program goals; inability to document the precise intervention; variability of process and program implementation; variability of outcome criteria; inappropriate instrumentation; small non-homogeneous samples; lack of comparable control groups or programs; inadequate time frame and too few measures; biased or poorly qualified evaluators; insufficient funds and resources for evaluation; paucity of multicultural data; and genuine lack of impact on selected populations (Roberts & Wasik, 1990; Mahoney, O'Sullivan, & Dennebaum, 1990; Soboloff, 1981; Leib, Benfield, & Guidubaldi, 1980; Simeonsson, Huntington, &

Short, 1982; Ramey, Campbell, & Wasik, 1982; Garwood, 1982; Wang & Ellett, 1982; Takanishi & Feshbach, 1982; Zigler & Berman, 1983; Maisto & German, 1979; Halpern, 1984; Sheehan & Keogh, 1982; Dicken, McKim, & Kirkland, 1983; Marfo & Kysela, 1985; Honig, 1983; Gray & Wandersman, 1980; Bricker & Littman, 1982; Sheehan, 1981; Ferry, 1981; Simeonsson, Cooper, & Scheiner, 1982; Bronfenbrenner, 1975; Bricker, Sheehan, & Littman, 1981; Coulton, 1988; Powell, 1982; Bricker, Carlson, & Schwarz, 1981; Garwood, 1982; Zigler & Balla, 1982; Dunst, Trivette, & Deal, 1988).

The future of evaluation in early intervention is directed toward continued efforts at quantifying the qualitative impacts reported anecdotally by practitioners. Current research techniques include: meta analyses to synthesize and interpret the vast body of existing evaluative research; longitudinal development studies to prove the underlying beliefs and assumptions about longterm program benefits; and component based program evaluations to causally link specific processes with outcomes.

Theoretical Foundation for the Research Instrument

The Family Stress and Coping Questionnaire was constructed specifically for this investigation. Appendix II was the form used with the Treatment and Pre-Treatment Groups; Appendix III (a subset of the questionnaire used for the treatment families) was the form used with the Control Group. The instrument was derived from four respected and well-established tools for measuring parent stress and coping: The Parenting Stress Index, or PSI by Abidin (1986); The Family Crisis Oriented Personal Scales, or F-Copes by McCubbin, Olson, and Larsen (1981); The Family Inventory of Resources for Management, or FIRM by McCubbin and Patterson (1981); and The Psychological Well-Being Scale by Bradburn (1965).

These instruments are widely used in the family therapy field, have sound theoretical foundations, demonstrated reliability and validity, and can differentiate "normal" families from "special needs" families. Specific items were selected from each of these base instruments, to form The Family Stress and Coping Questionnaire used in this investigation. The items were chosen for their similarity to the ideas and concepts intended in the causal models, put forth by the Calgary Early Intervention Program staff.

PART I of The Family Stress and Coping Questionnaire asks for demographic data. This information is needed to communicate effectively with other programs, about the families this particular early intervention program serves. These demographic variables were available for use as exogenous concepts and indicators in the LISREL models. The key weakness in PART I of The Family Stress and Coping Questionnaire, is that developmental assessments and child IQ were not included as recommended by several early intervention program evaluation experts. The Calgary program does not routinely conduct IQ testing or standardized developmental testing on the children, so this information was not readily available to collect for this section or include in the models.

PART II of The Family Stress and Coping Questionnaire corresponded to the intervening concepts and variables used in the LISREL models, i.e. family resources, coping, and well-being.

Although they are related a distinction needs to made between social resources, psychological resources, and specific coping responses. Resources refer not to what people do, but to what is available to them in developing their coping repetoires. Social resources are found in the interpersonal networks of which people are a part, and these are a potential source of valuable support: family, friends, co-workers, neighbours, community groups, etc. Psychological resources are the personality characteristics that people draw upon to help them withstand threats posed by events and objects in their environment. Examples of psychological resources are mastery, self-esteem, and well-being. Coping responses are the thoughts and behaviours people utilize when actually contending with daily problems (McCubbin, Cauble, & Patterson, 1982).

McCubbin, Olson, and Larsen (1981) have researched family resources and coping extensively. They conceptualize eight types of effective coping behaviour which families develop in response to problems or difficulties: confidence in family problem solving ability; reframing family problems; family passivity;

church / religious resources; extended family; friends; neighbours; and community resources.

McCubbin and Patterson (1981) have conceptualized family resources as comprising eight intrafamily strengths, social support, and financial security. The areas of strength include: family esteem (reports from friends and relatives); communication; optimism; problem solving ability; encouragement of autonomy; mastery; and emotional health.

Dunst, Trivette, and Deal (1988) have found that informal social support (i.e. support from family and friends rather than a social program) is consistently a mediating resource in early intervention. They claim early intervention is most effective with those families who have a high level of informal support, and the best intervention strategy is to help families build on these resources.

Dunst and Trivette frequently use psychological well-being as an outcome criteria in their research on early intervention. Bradburn (1965, 1969) theorized that people experience two kinds of psychological well-being -- negative and positive. These terms denote happiness and are a consequence of an individual's ability to cope with the stresses of everyday living. A person may experience positive and negative psychological well-being simultaneously, since they are independent concepts with separate origins. He conceptualized positive and negative psychological well-being as cancelling each other until there is more of one than the other, and this remaining balance determines the overall well-being of a person.

In PART II of The Family Stress and Coping Questionnaire, questions #1,2,3,4 come from FIRM and these are the reported factor loadings for each: (#1)0.71 (#2)0.62 (#3)0.54 (#4)0.78. Questions #5a,b,c,d,f,g, come form F-COPES and these are the factor loadings for each: (#a)0.64 (#b)0.65 (#c)0.64 (#d)0.70 (#f)0.81 (#g)0.69. Each of these F-COPES and FIRM items come from multi-item subscales which also have reported validity and reliability coefficients. Question #5e was added to the set following face validity testing of The Family Stress and Coping Questionnaire, by this author. Question #6 is derived from the Bradburn scale which is twelve items in length. Specific factor loadings are not reported for these items, but the test-retest reliability for the total Bradburn scale is 0.90. Internal consistency for the positive factors (#6a,b) is reported as 0.55-0.73, and for the negative factors (#6c,d) as 0.61-0.73.

PART III of The Family Stress and Coping Questionnaire corresponded to the endogenous concepts in the LISREL models, and comes entirely from the PSI. Although Abidin (1986) never explicitly defines the term "parenting stress", it appears to mean "the stressors, stress reactions, and parent-child interaction problems resulting from child characteristics and parent perceptions". His instrument is designed to detect a parent-child system with excessive stressors and stress reactions. While it is preferable from a theoretical perspective to separate these two concepts, it is appropriate from a clinical perspective to work with stressors and reactions in combination.

In Abidin's model, the child characteristics thought to influence parenting stress are:

adaptability or plasticity; mood; acceptability of child to parent; demandingness or degree of bother; distractability or hyperactivity; and reinforcement of parent. The parent characteristics thought to influence parenting stress are: depression and guilt; attachment; restrictions imposed by parenting role; sense of competence; social isolation; relationship with spouse; and health. General life stress (e.g. a new birth, death of a significant person, marriage, divorce, loss of job, etc.) also contributes to parenting stress.

Again each factor chosen from the PSI for PART III of The Family Stress and Coping Questionnaire, was taken from a multi-item subscale. The factor loadings from the PSI are not reported, but the reliability and validity statistics for each subscale are available. Following are the coefficients of factor similarity for the scale, from which each item was selected: (#1)0.88 (#2)0.97 (#3)0.82 (#4)0.71 (#5)0.79 (#6)0.93 (#7)0.99 (#8)0.84 (#9)0.85 (#10)0.93. These are the alpha reliabilities reported for the subscales from which each item was selected: (#1)0.66 (#2)0.70

(#3)0.63 (#4)0.62 (#5)0.73 (#6)0.55 (#7)0.79 (#8)0.75 (#9)0.70 (#10)0.70.

PART IV of The Family Stress and Coping Questionnaire was used with program families only. This section collected information primarily of use for formative program evaluation purposes.

Structural Equation Modeling with LISREL

This section answers some of the more frequently asked questions about LISREL, and is intended as an introduction / orientation for readers with no prior background in causal modeling. Hayduk (1987); Duncan (1975); Boyd, Frey, and Aaronson (1988); Aaronson, Frey, and Boyd (1988); Bentler and Chou (1987); Bentler (1988); Anderson and Gerbing (1988); and Cuttance (1987), are excellent sources of further, more indepth information on this topic.

What are structural equation models?

Structural equation models are theoretical models of complex relationships among multiple variables. Although the models will eventually be translated into statistical equations and compared with "real world" data, it is important to emphasize that their origins are in substantive theory. (This is different from other methods that build statistical models based on the data collected. These models may or may not have theoretical validity.) Structural equation modeling is a data analysis strategy that enables one to develop, test, and hopefully advance theories. This form of multivariate analysis is historically relatively new, having been developed and disseminated in an accessible form only during the last decade.

What is LISREL?

LISREL (analysis of linear structural relations) is the computer program most widely available for estimating structural equation models (Joreskog & Sorbom, 1989). Often the term LISREL is used to encompass the methodology of structural equation modeling. With LISREL the theoretical model is translated into three basic equations (containing four matrices of coefficients), and four additional covariance matrices. LISREL can be used to analyze data from surveys, experiments, quasi-experimental designs, and longitudinal studies. LISREL allows one to test the goodness of fit of models, to diagnose problems with models, to fix or constrain model coefficients, to do multi-group analyses, to estimate means, intercepts, and slopes, and to distinguish between latent concepts and observed indicators.

Can LISREL prove cause and effect relationships?

Strictly speaking, no, LISREL cannot definitively prove cause and effect relationship -- only rigorous and repeated experimental research designs prove causation. However LISREL models are consistent with causal thinking. Each conceptual model hypothesizes very specific effects of independent variables on dependent variables, i.e. the model specifies the direct effects, indirect effects, spurious effects, and correlations among the variables of interest.

Theoretical relationships between variables are called paths, and are depicted by arrows. Each path / arrow has a structural parameter (Greek letter) associated with it, which is estimated in the analysis and given a statistical parameter or numerical value. The structural / statistical parameters reflect the amount of change in the caused variable, that results from a unit of change in the causal variable, when all other variables are held constant.

Some experts believe LISREL (structural equation modeling) to be a more powerful analysis with respect to causation, than other traditional methods such as regression, analysis of variance, path analysis, and factor analysis.

Why is LISREL appealing to program evaluators?

Many social and health care programs have qualitative or "soft" effects that are difficult to quantify and defend statistically. Historically program evaluations have avoided investigating these effects even when they are the primary goals of a program, in favour of the more easily measured albeit secondary effects. LISREL offers a mechanism whereby program outcomes can be linked to program processes or interventions, and qualitative impacts measured quantitatively.

Although a large random sample is ideal, LISREL does not require hundreds of subjects to study the effects of a program -- a representative sample of approximately five subjects per model variable is a sufficient minimum. Sample size is contingent on the complexity of the model not statistical power; so if the model is highly specific and parsimonious with approximately six variables, only thirty subjects are required to test the validity of the model /

hypothesis. This is a very appealing aspect since many programs are small, and evaluations suffer from poor rates of client participation.

LISREL is also ideal for program evaluation since it allows / requires the program implementers to hypothesize the model of impact. It is not left solely to the evaluator to detect the outcomes and mechanisms of effect (as is traditionally the situation), but rather up to the program staff and participants to propose theories on the value and efficacy of their program. This is sound evaluation process since the program staff become integral participants of the study, and will potentially better utilize the research findings. It also ensures the evaluation models are relevant, individualized to the program, and derived from expert opinion.

What are the strengths of this metholodology?

LISREL allows the investigator to formulate and test a cause and effect theory without an experimental design; it is both an exploratory and confirmatory methodology. If the implications of a theory are not substantiated by real world data, the model can be altered (within the confines of sound theory) and re-evaluated.

LISREL systematically addresses the issue of spuriousness, since spurious effects can be controlled through modeling. This aspect is a fundamental requirement in proving causation.

LISREL models force the investigator to distinguish between abstract concepts and observed indicators; therefore one can address and control for poor measurement quality in the data analysis. This issue is often overlooked in other forms of analysis. No other metholodology performs at these three levels.

What are the weaknesses or problems with LISREL?

Structural equation modeling can partially compensate for less than perfect research designs (i.e. potential confounders can be modeled and thereby controlled), but it is not a substitute for good research. If there are deficiencies at any step in the research process, i.e., in the theory base, causal modeling, design, sampling, data collection, instrumentation, analysis, interpretation, etc., the derived numerical estimates and implication structure may be meaningless. A close fit between S and Σ, does not necessarily prove the correct model has been estimated with sound data; models having no theoretical basis or little resemblance to the real world can be specified and estimated. The direction and magnitude of effects obtained from the analysis can be believed only if the model was constructed prior to data collection, the hypotheses are well grounded in theory, and the Chi-Square value indicates a good model fit.

LISREL requires that the theory base is developed enough to provide very precise guidance on where effects should be found; models must be parsimonious and highly specific. Models with multiple two-way effects are problematic for this analysis, yet many social theories hypothesize just such complexity of interaction among variables. Model concepts must be either exogenous or endogenous, i.e. an independent variable cannot receive direct effects from other variables in the model; yet the real world is often not that simple. Multiple indicators of a concept often present difficulties in the analysis -- many factor models are disproved with this methodology. It is important to select one, or at most two of the best indicators of the concept being measured -- multiple indicators must behave identically. If by chance an investigator has the correct theoretical concept but a poor indicator, the analysis will show no impact.

The process of estimating measurement error is very subjective, and can either magnify or mask effects. If error is over-estimated effects will be magnified; if error is under-estimated effects will be lost. Research results can also be biased if there is repeated implementation of the modification indices to improve the Chi-Square, or reliance on the $\boldsymbol{\mathcal{S}}$-matrix for direction on where effects can be modeled. The data collected is to be used to test a hypothesis not to generate the theory, and model modifications should be primarily theory driven rather than data driven. A large sample size can raise the Chi-Square value and mislead one to believe the model fits poorly. Only a sophisticated reader however would be able to critique a LISREL study, and detect these subtle biases in a published research report using this methodology.

Interpreting the program output, diagnosing problems (such as colinearity, misspecification, and under-identification), and revising models, requires extensive experience with structural equation modeling. Problematic models can potentially be mathematically corrected without being substantively changed, but this is not an introductory level skill. For example, nesting models, stacking models, modeling loops, replacing measurement errors or structural disturbance terms with concepts, replacing one coefficient with two, or constraining one effect to equal or exceed another, may improve the chances of success in modeling a theory. Since LISREL and structural equation modeling are so new, few traditional statisticians are familiar enough with the methodology to understand the pitfalls and complexities. Consequently beginners may encounter difficulties in finding expert consultants to assist them with the highly technical and specialized aspects of this methodology.

What are the fundamental assumptions underlying LISREL?

When using this methodology the investigator is assuming the causal theory can be translated into, and accurately represented by, the three matrix equations. All hypothesized effects are assumed to be equal across subjects, i.e. the equations describe the behaviour of each individual, as well as the group of individuals.

LISREL like multiple regression, assumes the errors on the endogenous variables are independent of the exogenous variables.

LISREL also assumes the modeled variables are distributed normally throughout the general population. The critical test of significance (i.e. a Chi-Square measure of goodness-of-fit that uses the Wishart distribution) is only accurate if the sample has been randomly selected. Again this assumption is not unique to the methodology; other forms of multivariate analysis are contingent on random sampling and normally distributed variables.

What is the process when applying LISREL to evaluation?

1) Define the implicit causal hypotheses underlying the program or intervention.

2) Draw a path diagram of the causal model or theory one is trying to prove.

3) Translate the path diagram of words into a LISREL model of Greek symbols.

4) Transform the LISREL model into three matrix equations. This set of matrix equations is called sigma Σ, and represents the theory the investigator is trying to validate. Sigma contains the model's predictions about the variances, covariances, and means of the observed indicators. It also contains the unknowns or parameters that have been set free, and LISREL has been requested to estimate -- these unknowns are usually the effects of the program or intervention, on the important outcome variables.

5) Select representative samples from the program or treatment group, and the comparison or control groups. The sample size should be at least five times the number of concepts in the model; it must be larger than the number of estimates requested of LISREL.

6) Collect data on the observed indicators of the concepts of interest. Estimate the magnitude of error in measuring the concepts (%). This estimation encompasses the investigator's opinion of the quality of the data collection and entry processes, as well as

a judgement of how well the observed indicator measures the intended concept.

6) Create a variance / covariance matrix of the observed variables. This is called the S-matrix, and represents the "real world" data against which the theory will be tested.

7) Enter the LISREL commands into the program, using the S and Σ matrices and estimates of error. The commands specify which effects should be estimated, and which relationships should be fixed.

8) Execute the program. LISREL uses Maximum Likelihood Estimation to arrive at the estimates of effect. This means it strives to simultaneously match the real world data as much as possible, yet optimize the Chi-Square value and probability of the model being true. LISREL then compares the model as expressed by the sigma matrix Σ, to the data collected from the real world in the S-matrix, and determines how well they match, i.e. how well the theory is substantiated by the real world.

9) Analyze the results. Revise and retest the model if theoretically appropriate. Only the model can

change -- the data collected are considered the "truth" and cannot be altered.

10) Decide on the program changes that are required (if any) based on the interpretation and implications of the findings. Sometimes the LISREL analysis will reveal a program or intervention is having no significant effect, or an effect opposite to what is intended.

What do the Greek symbols and equations mean?

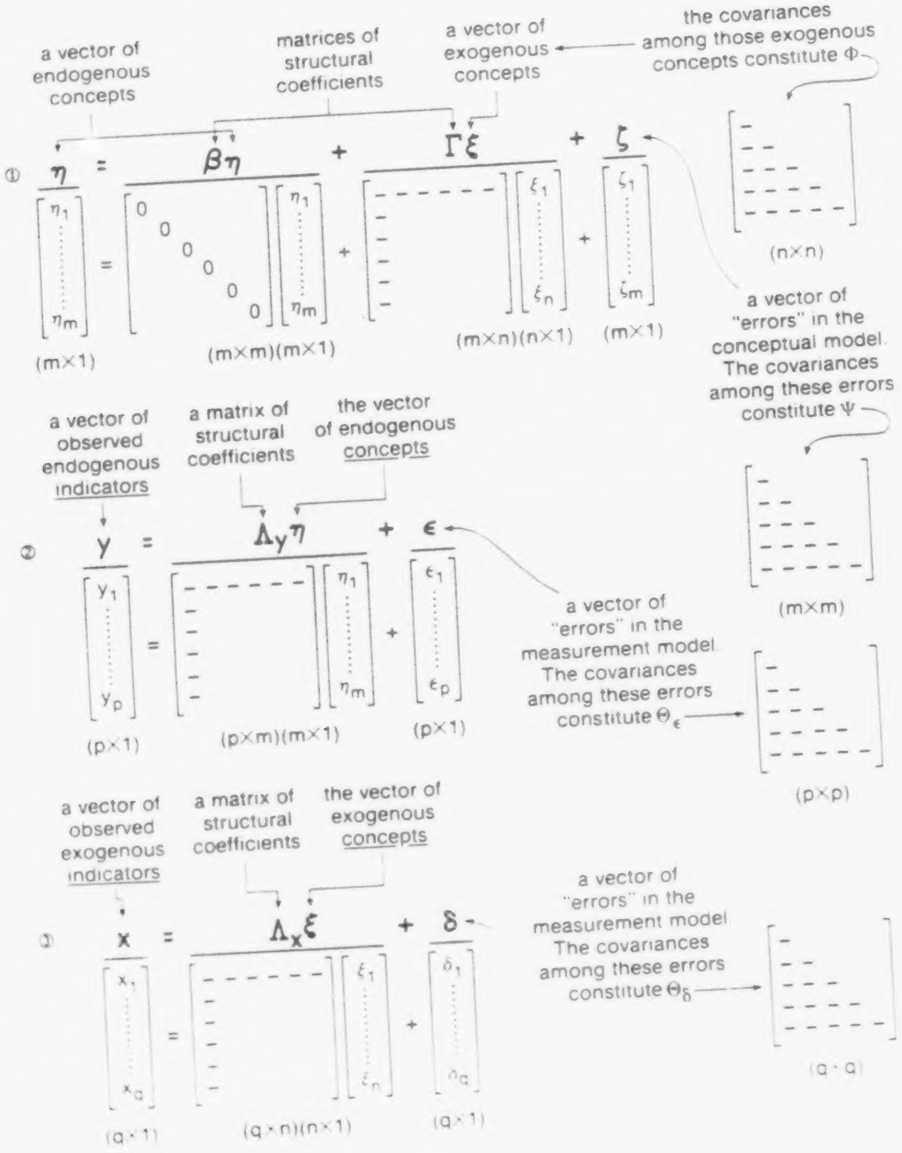
Refer to Figure 2 for a "blueprint" or general summary of the matrix equations used to create a LISREL structural equation model. Equation #1 represents the relationship between the conceptual level variables in the model; Equations #2 and #3 represent the relationships between the concepts and observed indicators. The four matrices PHI, PSI, THETA EPSILON, and THETA DELTA are explained below.

Familiarity with the following symbols is helpful when reviewing the results of a LISREL analysis.

"KSI" ξ This Greek symbol represents an independent or exogenous conceptual level variable. An independent variable is allowed to covary or correlate

Figure 2. Summary of the General Structural Equation Model

Source: Hayduk, L.A. (1987). *Structural equation modeling with LISREL: Essentials and advances*. Baltimore: Johns Hopkins University Press.


a vector of endogenous concepts
matrices of structural coefficients
a vector of exogenous concepts
the covariances among those exogenous concepts constitute Φ
① η = βη + Γξ + ζ
(m×1)
(m×m)(m×1)
(m×n)(n×1)
(m×1)
(n×n)
a vector of "errors" in the conceptual model. The covariances among these errors constitute Ψ
a vector of observed endogenous indicators
a matrix of structural coefficients
the vector of endogenous concepts
② y = Λyη + ε
(p×1)
(p×m)(m×1)
(p×1)
(m×m)
a vector of "errors" in the measurement model. The covariances among these errors constitute Θε
(p×p)
a vector of observed exogenous indicators
a matrix of structural coefficients
the vector of exogenous concepts
③ x = Λxξ + δ
(q×1)
(q×n)(n×1)
(q×1)
a vector of "errors" in the measurement model. The covariances among these errors constitute Θδ
(q×q)

with other independent variables, but it cannot be caused by another variable in the model.

"PHI" ϕ This figure represents a relationship between exogenous concepts in the model. It is expressed either as a covariance between two ξ's , or the variance of a single ξ . The PHI matrix depicted in Figure 2 contains these relationships. The computer output expresses ϕ as PH.

"ETA" η This symbolizes an endogenous conceptual level variable. Eta concepts are either dependent or intervening, meaning they are caused by ξ or other η.

"ZETA" ζ Conceptual error due to important η omitted from the model, is expressed by this symbol. LISREL automatically estimates this value. Zeta is really an impact estimate of the other factors causing an η . Zeta is an indication of the quality of the causal model or completeness of the theory it depicts.

"PSI" ψ The PSI matrix in Figure 2 contains information about the relationships between the ζ , or omitted conceptual level variables. Each ψ is an error variance for the prediction of an η . Significant ψ values can indicate a spurious cause of η

that has been left out of the model. The computer output identifies Ψ as PS.

"X" The observable measures of ξ are expressed as X's. If there are two or three observable measures of a concept, they must behave identically. The data collected on questionnaires become the X's and Y's in the model.

"Y" The observable measures of η are expressed as Y's. As stated above, if there are multiple indicators of a concept they should all behave identically.

"LAMBDA" λ This symbol represents the relative scale of a conceptual variable to its observable measure. There are lambda parameters for all X's and Y's in the model. Usually λ_x and λ_y are set to 1.0, indicating a one unit change in the concept can be measured by a one unit change in its indicator. If there are multiple indicators of a concept, one lambda coefficient is set to 1.0 and the others are estimated by LISREL. This parameter is not an indication of measurement quality, but just a specification of relative measurement scale. The computer output expresses λ_x and λ_y as LX and LY.

"DELTA" δ This symbol represents the measurement error on X. Usually the researcher estimates this parameter based on first-hand knowledge of the literature and data collection process (i.e. you ask yourself how much of the variance in X is likely due to error). This forced acknowledgment and control for measurement quality is one of LISREL's strengths. If there are multiple indicators of a concept LISREL will estimate the amount of measurement error.

"EPSILON" ϵ This symbol represents the measurement error on Y. As with δ the researcher usually estimates how well Y measures the concept, in this case an η, based on the literature and data collection process. Delta and epsilon parameters provide for differentiation of the conceptual and measurement portions of a model.

"THETA DELTA" Θ_δ The theta delta matrix in Figure 2 contains the relationships between δ's. It is a variance / covariance matrix for measurement error on X. There may be a common source of error causing covariance among the δ's. The computer output expresses Θ_δ as TD.

"THETA EPSILON" Θ_ϵ The theta epsilon matrix in Figure 2 contains the relationships between ϵ's . It is a variance / covariance matrix for measurement error on Y. Sometimes there is a common source of error causing covariance among the ϵ's. The computer output expresses Θ_ϵ as TE.

"BETA" β This symbolizes a relationship of impact on an η from another η , i.e. the effect on one dependent or intervening variable from another dependent or intervening variable. As discussed previously, LISREL provides beta and gamma estimates of effect using Maximum Likelihood Estimation.

"GAMMA" γ This symbol represents a relationship of impact on one η from a ξ , i.e. the effect on one dependent or intervening variable from an independent variable.

"S" This is a variance / covariance matrix of X and Y variables (i.e. the data collected). The S matrix is a mathematical expression of the "real world", against which the sigma model will be tested. Discrepancy between S and Σ may be due to sampling error or poor causal modeling.

"SIGMA" Σ This is the variance / covariance matrix of X and Y variables that is predicted by the model. Sigma is a mathematical expression of the implications of the theory or hypothesis that has been modeled. If S and Σ are similar, it means the model has been substantiated by the data collected.

"CHI-SQUARE" χ^2 The Chi-Square test for goodness of model fit used in this analysis, is different from the traditional Chi-Square test of significance. This symbol is an expression of the match between S and Σ, i.e. it expresses how well the model or theory is supported by the data. The Chi-Square value is only one indication of how well a model fits the data.

This Chi-Square is based on the Wishert Distribution, rather than the standard normal distribution. The Wishert Distribution equates Σ to the true population and S to the selected sample, and provides probabilities for the following question: "If I took a random sample of size=n from this kind of population (Σ), how likely is it that I'd get this kind of data (S)". The LISREL Chi-Square is discussed further in the next section.

How is the LISREL output to be interpreted?

Depending upon the complexity of the structural equation model under analysis, the output generated by LISREL can be voluminous and very intimidating. There are fewer than ten sections in the output however, that are very important for analysis and interpretation.

Covariance Matrix

The Covariance ($\mathbf{S}$) Matrix is presented early in the analysis. As discussed above, this matrix is a mathematical summary of the "real world" data that have been generated from the data collection. This matrix describes how the key variables really behave with respect to variance, covariance, and means. The structural equation model or sigma Σ matrix created, is tested against this $\mathbf{S}$ matrix. If the model is correct its implication structure is reflected in the real world, i.e. the variances, covariances, and means of the key variables are similar to that which occurs in reality.

Estimates of Effects

The estimates of impact that have been requested of LISREL, are presented in several different ways. For this analysis the Unstandardized Maximum Likelihood

Estimates are considered most important. LISREL provides estimates for beta, gamma, phi, and psi effects. If multiple indicators are used in the model, LISREL provides estimates for lambda-X, lambda-Y, theta delta, and theta epsilon. The magnitude of the effects is difficult to interpret since this solution is unstandardized.

Standardized Solution

The Maximum Likelihood Estimates are standardized in this section, i.e. the estimates of effect are given a mean of zero and standard deviation equal to 1.0. The process of standardization makes the beta and gamma effects easier to interpret, e.g. if GA(1,3) has a standardized effect of 0.5, this means eta3 increases by half a standard deviation in response to a one standard deviation increase in ksi1. A standardized effect close to zero is very small; and a standardized effect close to 1.0 is huge.

It is important to note the direction of effects between variables, as well as the magnitude. A positive effect means the two variables increase or decrease together; a negative effect indicates the two variables move in opposite directions.

Goodness of Model Fit

As discussed above, the Chi-Square value expresses how well the model fits the data. In this analysis the investigator wants the Chi-Square to be non-significant, indicating there is little difference between S and Σ. A non-significant χ^2 will fall between zero and one standard deviation from the mean of the distribution. In a LISREL Chi-Square distribution the mean and degrees of freedom are the same value. If for example, the Chi-Square has 3 degrees of freedom, one would want χ^2 to fall between zero and 5.4. The 5.4 is calculated by adding the 3 (i.e. the degrees of freedom / mean of the distribution) to the square root of double the mean, or in this case 2.4 (i.e. $\sqrt{2 \times 3} = \sqrt{6} = 2.4$ is one standard deviation from the mean).

Accompanying the χ^2 is a Level of Probability, which expresses the chance of finding S again if Σ is really true. An acceptable level of probability in a LISREL analysis is 0.3-0.5, or a 30%-50% chance of finding similar data again.

It is possible to have "excellent" effects (with respect to magnitude and direction) reported in the

Standardized Solution and Maximum Likelihood Estimates, yet have a poor Chi-Square or low Level of Probability. In this situation the SS and MLE must be ignored, since there is little chance the model is true. (A model is not necessarily "true" just because LISREL can provide estimates for it; unless there are technical problems poor models can usually be interpreted and estimated.)

The worst case scenario (from an evaluation perspective) is to have a non-significant Chi-Square with a high Level of Probability, and "poor" estimates of effect (i.e. the directions and magnitude of impact are contrary to expectation). In this situation the SS and MLE need to be acknowledged and accepted as probably true, (unless there are competing explanations for the findings).

Model Modification Indices

LISREL provides suggestions for model modification that if implemented, will decrease the Chi-Square χ^2 value. These suggestions are derived from the parts of the Σ model that fit the S data matrix least well. Modification indices should not be implemented unless they can be defended theoretically. LISREL of course has no idea which model changes are theoretically justifiable, it can only provide the suggestions based on statistical value.

Total Direct and Indirect Effects

This section provides the net effect of each model variable on another variable. These effects between variables may be direct or indirect, and may or may not have been modeled and requested. This section is helpful in revealing possible program impacts that have not been considered in the model. Sometimes the direction of total effects differs from the direction of Maximum Likelihood Estimates of effect. Although this complicates the overall interpretation of results, it is an indication of indirect causal pathways not considered in the model.

Residual Covariances

The section entitled Normalized Residuals (or Standardized Residuals) provides information on where the discrepancies between Σ and S are greatest. If the residual covariance between two variables is close to zero, it indicates the model fits the data well for that relationship.

The Q-Plot provided in the LISREL analysis is a visual representation of the Standardized Residuals.

The ideal Q-Plot is a straight line with few outlying points; all the points (and all the standardized residual covariances) should be within two standard deviations of mean zero. The slope of the Q-Plot line (i.e. 90° or 45°) is an indication of distribution of the residual covariances. If the Q-Plot is nonlinear, this indicates a poor model fit.

Standard Error and T-Values

LISREL provides a Standard Error for each parameter or coefficient it estimates. Large standard error values can indicate colinearity and identification problems with the coefficient.

The T-Values for each estimated coefficient are based on the Standard Error and Maximum Likelihood Estimate. A T-Value that exceeds ±2.0 means the estimated effect can be considered statistically significant at the 0.01 level. If the error terms in the model have been set free (i.e. LISREL has been asked to estimate TE and TD), the T-Value will indicate if measurement error is significantly beyond zero.

MLE Squared Multiple Correlations (R^2)

The Squared Multiple Correlations for each eta, are an indication of how much the model accounts for the variance in the concept. An R^2 close to 1.0 means the structural equation model explains the concept very well; an R^2 close to zero means the model lacks important causal pathways that impact the concept.

Evidence of Estimation Problems

There are many possible "symptoms" of estimation problems that require "diagnosis" and attention, in a LISREL analysis. As mentioned above, high Standard Error values can be an indication of colinearity and identification difficulties. Estimation problems are also evidenced by high Correlations of Estimates; large differences between the initial estimates (using Two Stage Least Squares Estimation) and the final estimates (using Maximum Likelihood Estimation); a high number of iterations or attempts at estimation (i.e. over 20 iterations is considered high); and wildly unrealistic estimates in any of the matrices e.g. a standardized beta effect greater than 1.0. Evidence of severe estimation problems with a model, means the final results should be treated with skepticism.

Conceptual Framework

The conceptual framework for this study was the LISREL structural equation models, depicting the causal hypotheses articulated by the Early Intervention Program staff members. Bricker, Sheehan, & Littman (1981) strongly recommend selecting an evaluation framework that is individual to, and consistent with, the actual implementation of an early intervention program. An evaluation framework based on the ideal or philosophic implementation of a program often fails to uncover effects, simply because there is a gap between theory and reality. There were six main models proposed by the Early Intervention Program staff (two each per staff member). Their selection of concepts and variables was supported by an extensive body of interdisciplinary research.

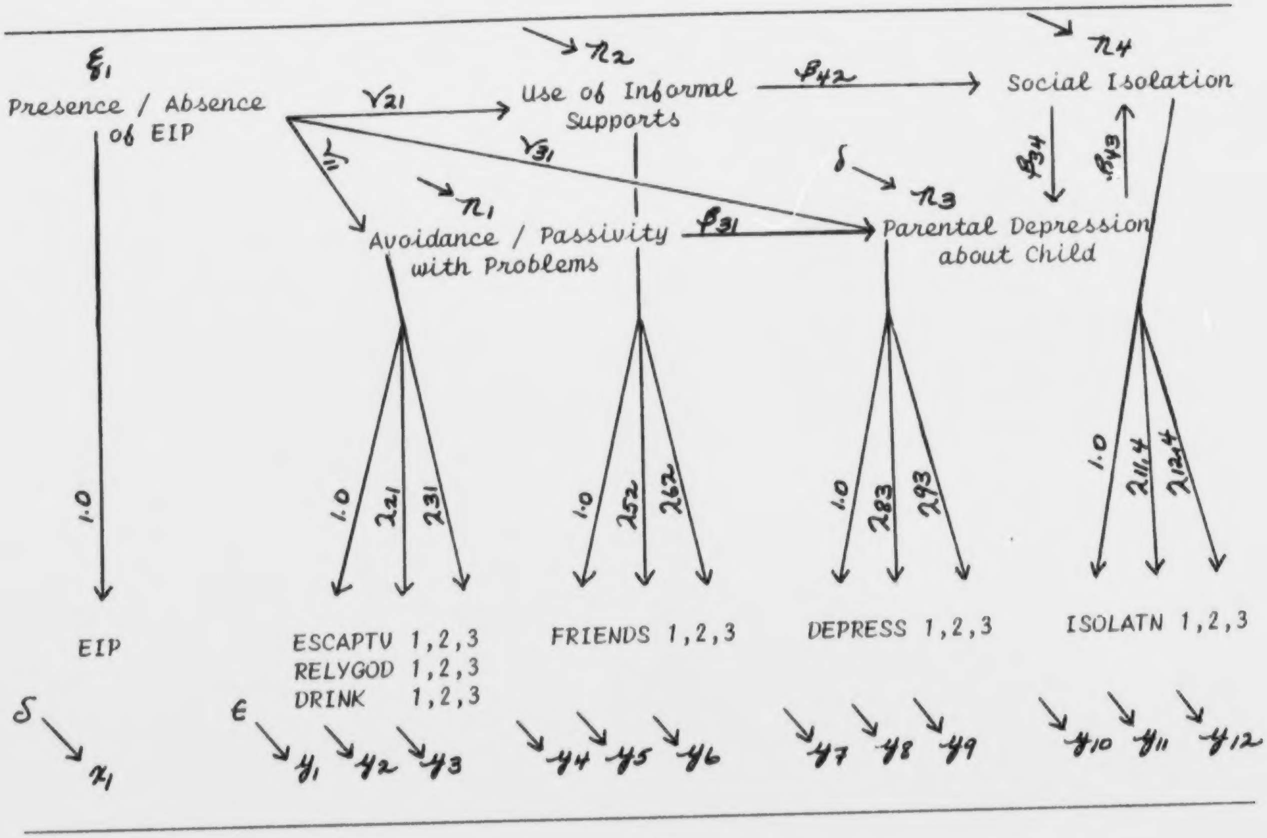
Model A

Refer to Figure 3 for the path diagram depicting Model A, and Appendix IV for the translation of this diagram into LISREL matrix equations. Refer to Chapter 4 for further explanation and description of the measurement variables.

Model A theorizes that the Early Intervention Program works by encouraging families to cultivate and utilize their informal support networks, thereby decreasing parents' social isolation in their role. In theory, the program is also effective in discouraging parents' avoidance and passivity with problems, thereby preventing or decreasing their depression about the child. The program can work in many other ways to directly decrease the family's depression about the child, but these mechanisms are not specified in Model A. Parents' decreased social isolation causes them to be less depressed about the child, and vice versa, their decreased depression leads to decreased social isolation.

The presence or absence of the Early Intervention Program was measured by the variable EIP. The concept of avoidance or passivity with problems, was measured by three variables at three different times: ESCAPTV, RELYGOD, and DRINK. These variables correspond to items II-5c,d,e, on the Family Stress and Coping Questionnaire. The concept of informal supports was measured three times by the variable FRIENDS, and

Figure 3. Conceptual Model A


ξ_1
Presence / Absence of EIP
γ_{21}
γ_{11}
γ_{31}
η_2
Use of Informal Supports
β_{42}
η_4
Social Isolation
β_{34}
β_{43}
η_1
Avoidance / Passivity with Problems
β_{31}
δ
η_3
Parental Depression about Child
1.0
1.0
λ_{21}
λ_{31}
1.0
λ_{52}
λ_{62}
1.0
λ_{83}
λ_{93}
1.0
$\lambda_{11,4}$
$\lambda_{12,4}$
EIP
ESCAPTU 1,2,3
RELYGOD 1,2,3
DRINK 1,2,3
FRIENDS 1,2,3
DEPRESS 1,2,3
ISOLATN 1,2,3
δ
x_1
ϵ
y_1
y_2
y_3
y_4
y_5
y_6
y_7
y_8
y_9
y_{10}
y_{11}
y_{12}

corresponds to item II-5f on the questionnaire. The concept of parental depression was measured at three different times by variable DEPRESS or the item III-8. The concept of social isolation was measured three times by variable ISOLATN or item III-10.

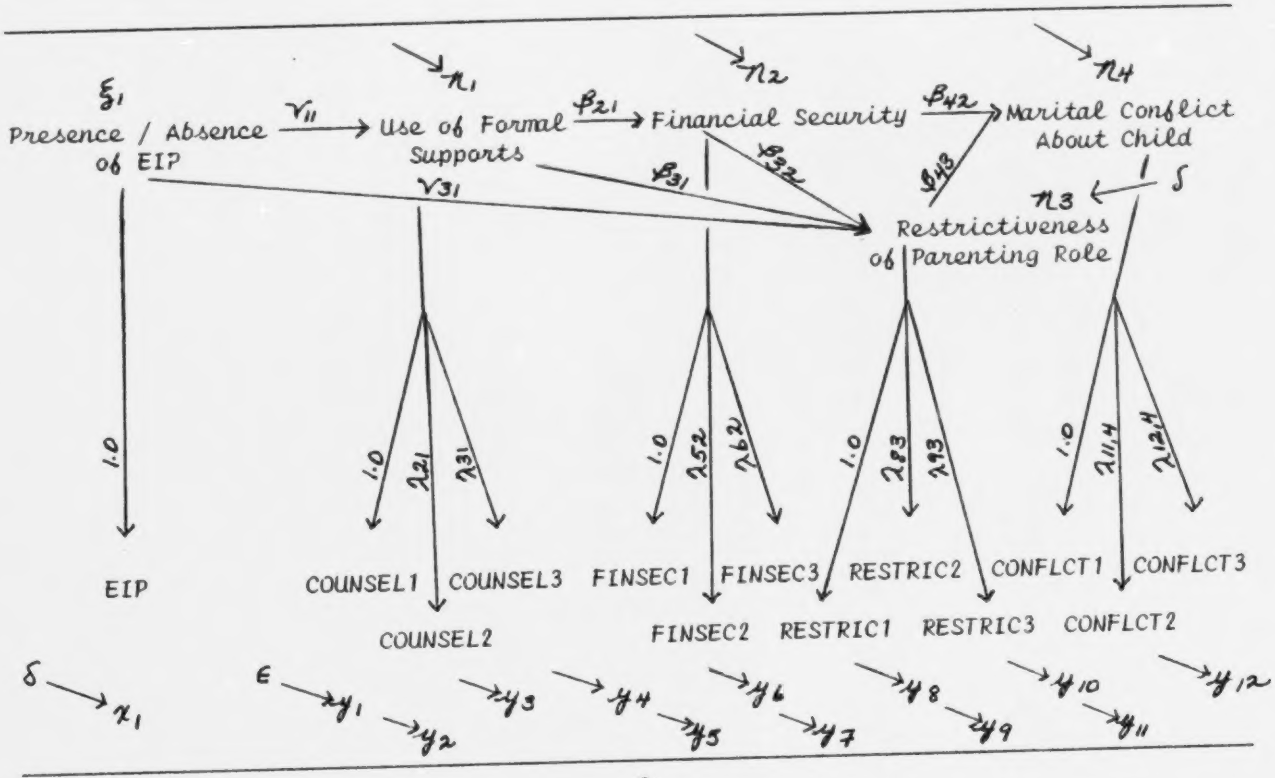
To avoid using multiple indicators for the concept of avoidance / passivity with problems, three versions of Model A were used: Model A1 with ESCAPTV, Model A2 with RELYGOD, and Model A3 with DRINK.

Model B

Refer to Figure 4 for the path diagram depicting Model B, and Appendix V for the corresponding matrix equations.

Model B represents the theory that the Early Intervention Program works by encouraging families to better utilize the available formal resources and support networks. This results in increased financial security for the family (because they would be receiving the required assistance with a special needs child), and subsequently decreased marital conflicts about the child. The increased financial security acts by decreasing the parents' feelings of restrictiveness

Figure 4. Conceptual Model B



ξ_1
Presence / Absence of EIP
γ_{11}
η_1
Use of Formal Supports
β_{21}
η_2
Financial Security
β_{42}
η_4
Marital Conflict About Child
γ_{31}
β_{31}
β_{32}
β_{43}
η_3
ζ
Restrictiveness of Parenting Role
1.0
λ_{21}
λ_{31}
λ_{52}
λ_{62}
λ_{83}
λ_{93}
$\lambda_{11,4}$
$\lambda_{12,4}$
EIP
COUNSEL1
COUNSEL2
COUNSEL3
FINSEC1
FINSEC2
FINSEC3
RESTRIC1
RESTRIC2
RESTRIC3
CONFLCT1
CONFLCT2
CONFLCT3
δ
x_1
ϵ
y_1
y_2
y_3
y_4
y_5
y_6
y_7
y_8
y_9
y_{10}
y_{11}
y_{12}

in their role, i.e. feeling that they are sacrificing a lot for their child, which also results in decreased marital conflict about the child. The Early Intervention Program is theoretically effective in decreasing the restrictiveness of the parenting role, via other mechanisms not specified in this model.

The presence or absence of the Early Intervention Program was measured with the variable EIP. The concept of utilization of formal supports was measured at three times in the variable COUNSEL, which corresponds with item II-5g on the questionnaire. The concept of financial security was measured three times as the variable FINSEC, which corresponds with item II-4. The concept of restrictiveness of the parenting role was measured at each data collection through the variable RESTRIC, which corresponds with item III-7. The concept of marital conflict was measured through the variable CONFLCT, or item III-9.

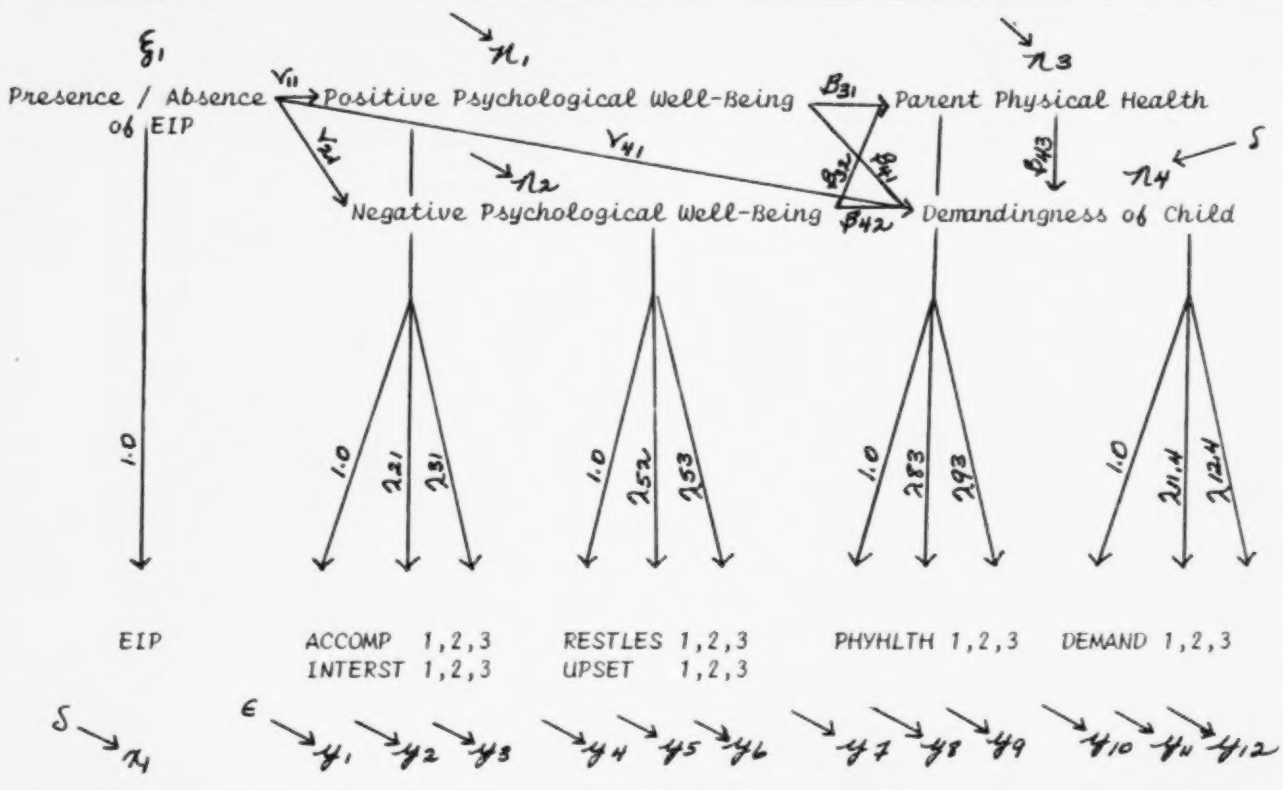
Model C

Refer to Figure 5 for the path diagram depicting Model C, and Appendix VI for the corresponding LISREL matrix equations.

Model C represents the hypothesis that the Early Intervention Program impacts parents by increasing their positive psychological well-being, and decreasing their negative psychological well-being. These two mechanisms each increase parental physical health, and cause parents to view their child as less demanding. Improved physical health also independently affects parents' perception of child demandingness. In theory, the Early Intervention Program impacts parents' perception of child demandingness, through other mechanisms not specified in this model.

The presence or absence of the Early Intervention Program was measured in the variable EIP. The concept of positive psychological well-being was measured in the two items II-6a,b, or the variables ACCOMP and INTERST. The concept of negative psychological well-being was measured in the two items II-6c,d, or the variables RESTLES and UPSET. The concept of physical health was measured in the variable PHYHLTH or item III-1. The concept of child demandingness was measured in item III-4, or variable DEMAND.

Figure 5. Conceptual Model C


ξ_1
Presence / Absence of EIP
γ_{11}
γ_{21}
γ_{41}
η_1
Positive Psychological Well-Being
η_2
Negative Psychological Well-Being
β_{31}
β_{32}
β_{41}
β_{42}
η_3
Parent Physical Health
β_{43}
η_4
δ
Demandingness of Child
1.0
1.0
λ_{21}
λ_{31}
1.0
λ_{52}
λ_{53}
1.0
λ_{83}
λ_{93}
1.0
$\lambda_{11,4}$
$\lambda_{12,4}$
EIP
ACCOMP 1,2,3
INTERST 1,2,3
RESTLES 1,2,3
UPSET 1,2,3
PHYHLTH 1,2,3
DEMAND 1,2,3
δ
x_1
ϵ
y_1
y_2
y_3
y_4
y_5
y_6
y_7
y_8
y_9
y_{10}
y_{11}
y_{12}

To avoid using multiple indicators for positive and negative psychological well-being, four versions of Model C were used: Model C1 with ACCOMP and RESTLES; Model C2 with ACCOMP and UPSET; Model C3 with INTERST and UPSET; and Model C4 with INTERST and RESTLES.

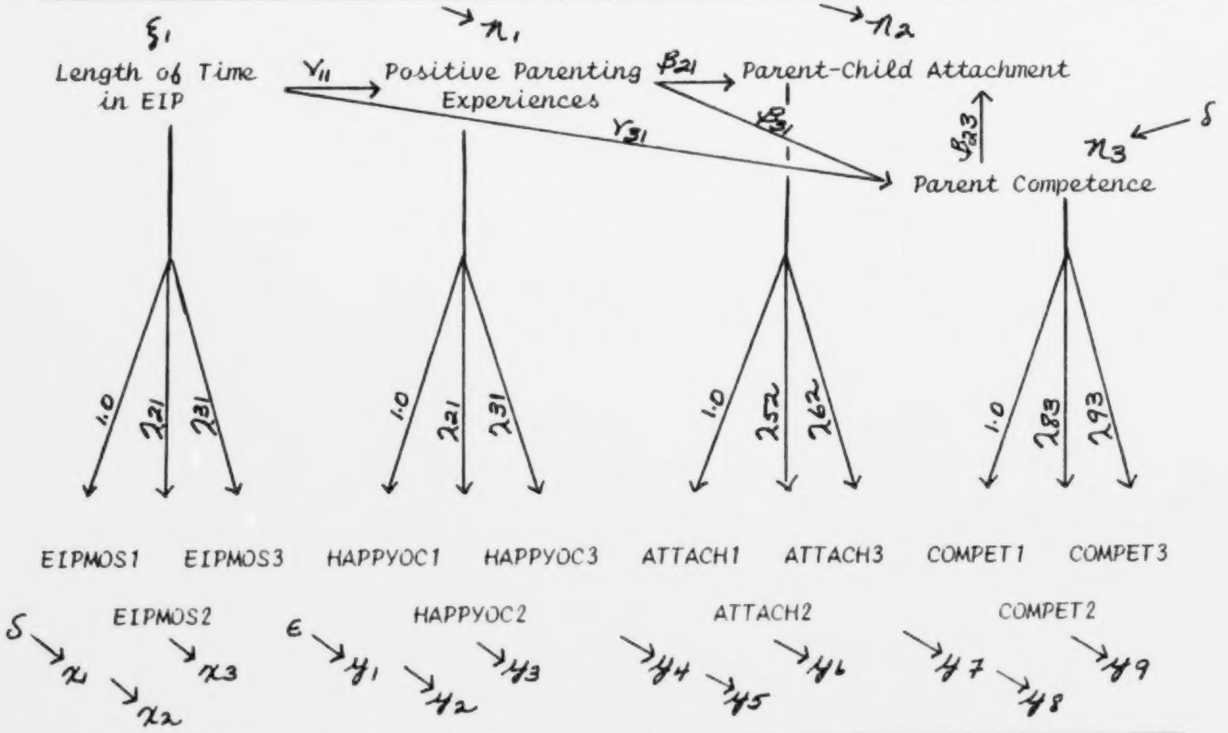
Model D

Refer to Figure 6 for the path diagram depicting Model D, and Appendix VII for the LISREL matrix equations representing this model.

Model D expresses the theory that the longer parents are active in the Early Intervention Program, the greater the number of positive parent-child experiences, and the greater the feeling of parenting competence. The increased number of positive experiences and the increased feelings of competence, result in greater parent-child attachment.

Length of time in the program was measured at each data collection and recorded under the variable title EIPMOS. The concept of positive parent-child experiences was measured at each time in Part IV (program families only), and recorded under variable HAPPYOC. The concept of parent-child attachment was

Figure 6. Conceptual Model D


ξ_1
Length of Time in EIP
γ_{11}
η_1
Positive Parenting Experiences
β_{21}
η_2
Parent-Child Attachment
γ_{31}
β_{31}
β_{23}
η_3
δ
Parent Competence
1.0
λ_{21}
λ_{31}
1.0
λ_{21}
λ_{31}
1.0
λ_{52}
λ_{62}
1.0
λ_{83}
λ_{93}
EIPMOS1
EIPMOS2
EIPMOS3
HAPPYOC1
HAPPYOC2
HAPPYOC3
ATTACH1
ATTACH2
ATTACH3
COMPET1
COMPET2
COMPET3
δ
x_1
x_2
x_3
ϵ
y_1
y_2
y_3
y_4
y_5
y_6
y_7
y_8
y_9

measured with item III-6, or variable ATTACH. The concept of parenting competence was measured with item III-5, or variable COMPET.

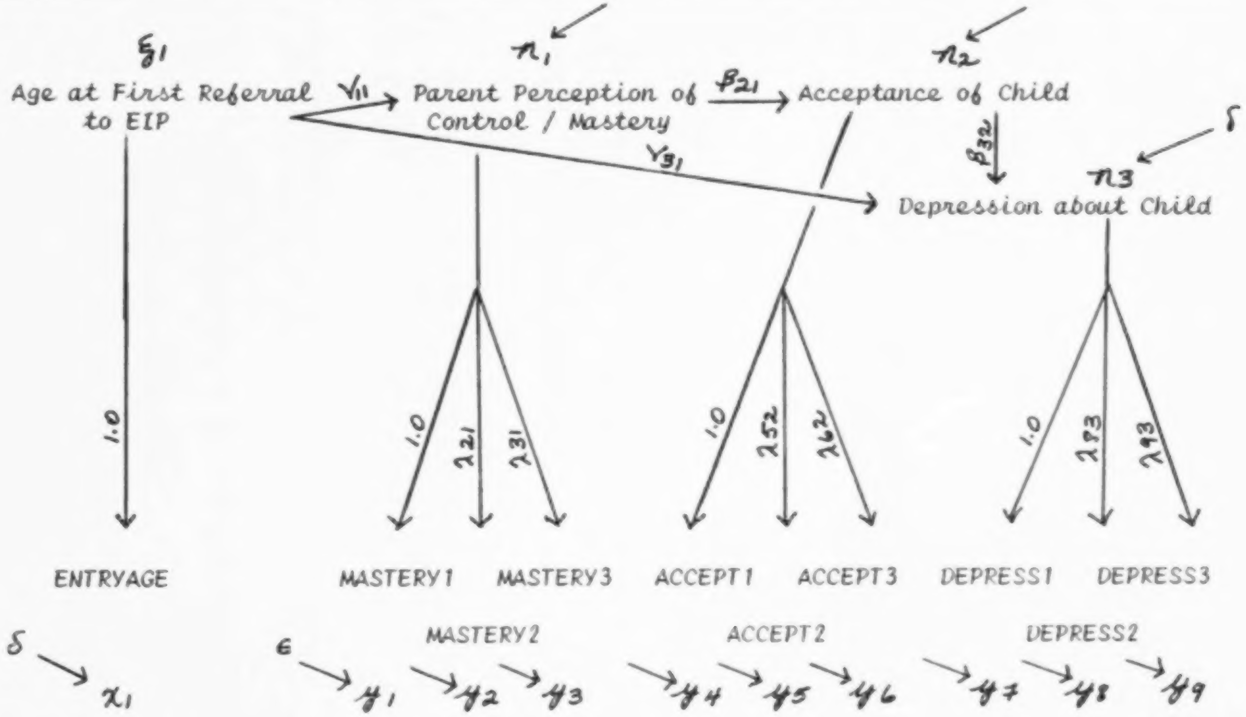
Model E

Refer to Figure 7 for the path diagram depicting Model E, and Appendix VIII for the corresponding LISREL matrix equations.

Model E represents the hypothesis that the younger the child is at the first referral to the Early Intervention Program, the greater his / her parents' perception of mastery or control over the situation. This increased perception of control leads to an increased acceptance of the child and his special needs, which in turn results in decreased depression about the child. There are other mechanisms by which the program prevents or decreases parental depression, if the child is referred at an early age, but these are not specified in this model.

The child's age at the first program referral was recorded in Part IV of the questionnaire, and input as variable ENTRYAGE. The concept of parental control or mastery was measured at three times by item II-2, and

Figure 7. Conceptual Model E


ξ1
Age at First Referral to EIP
γ11
η1
Parent Perception of Control / Mastery
β21
η2
Acceptance of Child
γ31
β32
δ
η3
Depression about Child
1.0
1.0
λ21
λ31
1.0
λ52
λ62
1.0
λ83
λ93
ENTRYAGE
MASTERY1
MASTERY2
MASTERY3
ACCEPT1
ACCEPT2
ACCEPT3
DEPRESS1
DEPRESS2
DEPRESS3
δ
x1
ε
y1
y2
y3
y4
y5
y6
y7
y8
y9

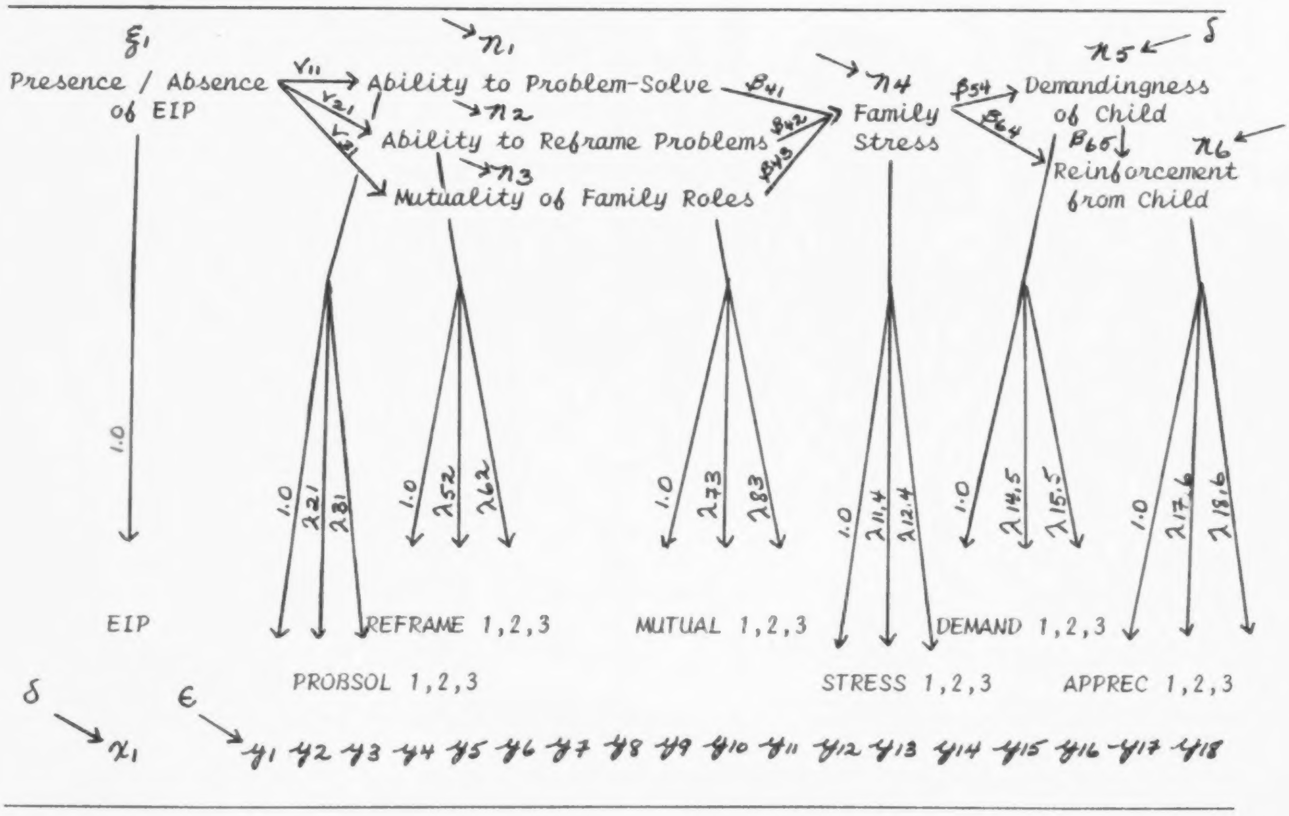
recorded as variable MASTERY. The concept of parental acceptance of the child was measured at three times by item III-3 on the questionnaire, and recorded as variable ACCEPT. The concept of parental depression about the child was measured by item III-8, and input as variable DEPRESS.

Model F

Refer to Figure 8 for the path diagram representing Model F, and Appendix IX for the LISREL matrix equations for this model.

Model F depicts the theory that the Early Intervention Program helps parents strengthen positive coping skills such as problem-solving, reframing perceived stressors, and developing mutuality of family roles. These skills all work to decrease family stress, which in turn leads to parents' decreased perception of child demandingness and increased perception of reinforcement from the child. This model also suggests that the decreased perception of child demandingness, can act independently to increase parents' perception of child reinforcement.

Figure 8. Conceptual Model F


ξ_1
Presence / Absence of EIP
γ_{11}
γ_{21}
γ_{31}
η_1
Ability to Problem-Solve
η_2
Ability to Reframe Problems
η_3
Mutuality of Family Roles
β_{41}
β_{42}
β_{43}
η_4
Family Stress
β_{54}
β_{64}
η_5
δ
Demandingness of Child
β_{65}
η_6
Reinforcement from Child
1.0
1.0
λ_{21}
λ_{31}
1.0
λ_{52}
λ_{62}
1.0
λ_{73}
λ_{83}
1.0
$\lambda_{11,4}$
$\lambda_{12,4}$
1.0
$\lambda_{14,5}$
$\lambda_{15,5}$
1.0
$\lambda_{17,6}$
$\lambda_{18,6}$
EIP
REFRAME 1,2,3
MUTUAL 1,2,3
DEMAND 1,2,3
PROBSOL 1,2,3
STRESS 1,2,3
APPREC 1,2,3
δ
x_1
ϵ
y_1 y_2 y_3 y_4 y_5 y_6 y_7 y_8 y_9 y_{10} y_{11} y_{12} y_{13} y_{14} y_{15} y_{16} y_{17} y_{18}

The presence or absence of the Early Intervention Program was recorded as variable EIP. The concept of parental confidence in problem-solving ability was measured at each data collection, by item II-5a and recorded as variable PROBSOL. The concept of parent's ability to reframe stressful events was measured by item II-5b, and recorded as variable REFRAME. The concept of mutuality in family roles was measured three times by item II-3, and recorded as variable MUTUAL. The concept of family stress was measured by item II-1, and listed as variable STRESS. Parental perception of child demandingness was measured at each time by question III-4, and labelled as variable DEMAND. Parental perception of reinforcement from the child was measured by item III-2, and recorded under variable APPREC.

Collectively, these six theoretical models represent the Calgary Early Intervention Program's intended impact, on families of young handicapped children.

CHAPTER III: METHODOLOGY

Research Design

This study utilized a mixed quasi-experimental design, i.e. there were elements of longitudinal, cross-sectional, repeated measures, and non-equivalent control group methodologies. This approach was the best possible alternative to a true experimental design, and is frequently used in evaluations of health and social service programs.

Sampling Methodology

There were three groups of subjects selected for participation in this investigation:

Treatment Group

The primary group of subjects was all the parents of children enrolled in the Calgary Health Services Early Intervention Program, at the outset of the study in January 1990. Only families with children 3 years of age or younger at January 1, were approached for participation. The families with program children older than 3 years (i.e. 11 families), were too near discharge to justify inclusion in the data collection. The Treatment Group numbered 37 eligible families, or 74 parents.

Pre-Treatment Group

The second group of subjects was all the parents of children newly admitted the Calgary Health Services Early Intervention Program, during the one year period January 1 to December 31 1990. The Pre-Treatment Group numbered 56 eligible families, or 112 parents.

Control Group

The third group was a non-equivalent control group of families with healthy children (i.e. children with no handicaps or serious medical problems), selected from the local day care centers. The Control Group numbered 250 families or 500 parents.

Twenty day care centers were chosen for sampling, based on their neighbourhood and location nearest a Treatment family (see Appendix X). Ten to fifteen families were selected as eligible for participation from each of the twenty day care centers, based on the age and sex of the child. Sampling was conducted to achieve the anticipated age and sex breakdown of the children in the Treatment and Pre-Treatment Groups, i.e. 20% children newborn to 6 months; 20% children 7 to 12 months; 35% children 13 to 24 months; 25% children 25 to 36 months; 60% male and 40% female children.

Protection of Human Rights

Permission to conduct this study was granted by the Ethics Review Committee at the University of Alberta Faculty of Medicine (see Appendix XI), and Calgary Health Services Department of Nursing (per Ms. Jan Besner), in late January 1990.

All families selected as eligible for participation in the study were provided an information letter, consent form, and questionnaires for examination. Each of the three groups was approached for consent in a slightly different manner:

Treatment Group

In late January 1990, the Early Intervention Program staff approached the 37 eligible Treatment families for consent to release their names and addresses to this student, for research purposes. All 37 families consented to release of this information so they could be mailed a packet containing an information letter about the study, a consent form to be signed if interested in participation in the study, and two questionnaires (one for each parent) for perusal and completion as Wave I of data collection (Appendix II).

The information letter for this group (see Appendix XII) contained the identity of the researchers, purpose and importance of the study, method and frequency of data collection, reassurance of confidentiality and voluntary nature of participation. The consent form (see Appendix XIII) reiterated the guarantee of confidentiality, the freedom to withdraw from the study without consequence, and the voluntary nature of their participation (i.e. no payment associated). Once the consent form was signed and returned to this student, it was considered valid for the entire year of data collection (i.e. all three waves of data collection).

Pre-Treatment Group

Once a new family was admitted to the program, the Early Intervention staff briefly explained the nature of the study and their support for parents' participation. The new or Pre-Treatment family was then left with a packet containing an information letter, consent form, and two questionnaires. The information letter (Appendix XIV) was similar in content to that provided the Treatment families; the consent form was identical (Appendix XIII), as were the questionnaires (Appendix II). Names and addresses of families from this group originated solely from the consent forms returned to the investigator.

Early Intervention Program staff were unaware of which families (Treatment or Pre-Treatment) participated in the study, until after data collection was completed at the end of the year. At this time a list of the Treatment and Pre-Treatment families who participated in the study was shown to the staff, in an effort to acertain potential bias or skew due to non-participating families.

Questionnaires were identifiable by code number only to the investigator; at no time were the completed questionnaires shown to the program staff. All completed questionnaires were mailed directly to the University, and did not pass through the program office at Calgary Health Services. Some confidentiality was lost when the staff was provided a summary of the parents' comments requested in PART IV of the questionnaire; although superficial attempts were made to disguise the source of compliments / complaints, some of the comments were clearly identifiable to the staff members.

Control Group

Each day care center staff differed in how they wanted their families approached for consent. Some of the centers agreed to just send a packet home with each child that was selected by this student. Some of the centers requested that the investigator speak with each selected family, when they arrived at the end of the day for their child. Some of the staff asked parents if they were interested in participating, and provided only those families with an information packet.

Each packet that Control Group families received contained an information letter, consent form, and two questionnaires. The information letter (Appendix XV) was similar to that received by the program families, except the name of the specific program under evaluation was not given. Families were informed in this letter that they were being asked to participate as part of a comparison group, because their child was young and healthy. The consent form was identical to that used for the program families (Appendix XIII). Two questionnaires (one for each parent) were also provided in the packet, for perusal and completion as Wave I of data collection (Appendix III).

All names and addresses of families in the Control Group were received from the consent forms returned to the investigator. Once initial access to the families was obtained, there was no further contact with the day care staff i.e. they were never informed of which families consented to participate, or the content of their responses. The day care staff was given the same information about the study as was contained in the letter to the Control Group families. The only information they provided the investigator about the families, was the age and sex of the child in their care.

Procedure for Data Collection

Data collection for the Treatment and Control Groups occurred in mid-February, early July, and late November of 1990 (approximately 20 weeks spacing each wave of data collection). There was no theoretical rationale for three measures (versus two, four, or five) -- the intent was to track change over a one year period, without undue bother to either the families or program staff.

Once the initial consent and first set of questionnaires was returned in the stamped self-addressed envelope provided with the introductory packet, families were followed for the remainder of the year, i.e. they were automatically sent another packet via mail in July and November. These packets again contained a letter of introduction / reminder, two questionnaires (unless parent had specified she / he was single), and a stamped self-addressed envelope for return. See Appendices XVI and XVII for the introductory letters sent in July and November to the Treatment Group, and Appendices XVIII and XIX for the introductory letters sent to the Control Group. The questionnaire was unchanged throughout the one year period of data collection.

Pre-Treatment families who chose to participate, completed the first questionnaire within a month of joining the program; they were then sent a second and third packet in July and November, if appropriate. The introductory letters used for the second and third waves of data collection, were the same as those used for the Treatment Group (i.e. Appendices XVI and XVII).

Families who consented to participate in the study but failed to return questionnaires later in the year, were contacted by telephone by the investigator (parents were given approximately six weeks to complete the questionnaires). If after one phone call, a questionnaire was not received it was assumed the family had decided to withdraw from the study. Follow-up phone calls were not always possible for the Control Group families, if they had not previously provided a number on the consent form and were unlisted in the telephone book.

Two of the program mothers had reading difficulties and were assisted with their questionnaires over the phone, by the investigator. At no time were program families assisted with their responses, by the Early Intervention staff.

Instrumentation

The Family Stress and Coping Questionnaire was used consistently in all three waves of data collection. As mentioned in previous sections Appendix II was used with Treatment and Pre-Treatment Group families, and Appendix III was used with Control Group families.

Refer to Chapter II for the theoretical background to this instrument. It was constructed specifically for this investigation, but has not been tested by traditional means for reliability and validity. Each item was reviewed by the Early Intervention Program staff for content validity (i.e. the item adequately expressed a concept they were trying to measure). The questionnaire was also reviewed by three committee professors knowledgeable in questionnaire construction, and a small facsimile sample of families (two each with handicapped and non-handicapped children) for clarity of wording and acceptability of questions.

Permission was obtained via telephone from Drs. Abidin and McCubbin for use of their questions; Dr. Bradburn or his publisher could not be located, but permission to use his four items was presumed since the Psychological Well-Being Scale is published.

Control Group families were instructed to complete the questionnaire thinking about their youngest child. In a few cases the family had a new baby during the 1990 year, so their subsequent questionnaires pertained to a different child. In a few other cases the questionnaires were completed for a child other than the one selected at the day care center. This instruction was given because of an anticipated dearth of control families with children under 6 months of age.

Statistical Analysis

Qualitative and quantitative analyses were performed on the data collected. The qualitative analysis involved summary of the themes and content of program parents' comments on Part IV of the questionnaire. Quantitative information was coded and entered into SPSS-PC+ V3.0. Descriptive statistics i.e. means, frequencies, and variances, were calculated for all variables using this program. The aim of the descriptive analysis was to establish the comparability of the three study groups.

The data files in SPSS-PC were exported via modem (with KERMIT 3.01 software on the TINA network), to the University of Alberta mainframe MTS system. Using SPSSX 3.0, Pearson correlations were obtained. The aim of the correlations analysis was to investigate the need for sub-group structural equation models.

Analysis of the structural equation models was accomplished with LISREL 6.6 in SPSSX (via modem). Structural equation modeling was chosen as the method of analysis in this study, primarily because of the history of poor evaluation results for early intervention programs. There is no documentation in the literature of early intervention program evaluation with this particular methodology. Structural equation modeling is a relatively new and powerful statistical methodology that does not necessarily require an experimental design or huge sample size. LISREL is especially suited for individualized evaluation of programs having modest qualitative effects. Structural equation modeling was used to give a "difficult to evaluate" program, the best possible chance at proving its effectiveness. Refer to Chapter 2 for a discussion of LISREL's strengths, weaknesses, and assumptions.

Limitations of the Design and Methodology

While this design was not perfect, it allowed the investigator to take advantage of all the information available over the course of one program year. It was relatively inexpensive to conduct (costs included photocopying of instruments, stamps and envelopes, and mainframe computer time). The time committment from the researcher's point of view, was highest during selection of the control group and at the data analysis phase. The Early Intervention Program staff and families were not asked to invest a significant amount of time and resources, for the conduct of this study --

although they likely found the repeated measures tedious and inconvenient.

Dramatic and "easy to measure" changes in the families could not be expected over the twenty week periods between data collections; but the quality of the data was better than what could be achieved by a one-shot investigation. There may have been some Hawthorne Effect on the part of the program staff, i.e. they may have intensified their focus on family stress and coping because they knew it was under evaluation. This would only have served to augment positive program effects and make them easier to detect and measure. Program parents may have felt more pressured to give socially acceptable answers to the questionnaire items, e.g. some may have found it difficult to acknowledge marital conflict or feelings of guilt about their child. It is unlikely however that program parents tried to protect the program by giving "nice answers" to questions about parenting stress, since most view the Early Intervention Program as primarily for infant stimulation rather than family support.

Since the program families presumably had some committment and interest in the operation of the Early

Intervention Program, response rates were expected to be high and drop-out rates relatively low. The control families had little incentive to initially consent, and then continue to participate throughout the year. Since participation in the study was completely voluntary, there was little that could be done about differential participation and drop-out except to monitor and ackowledge its impact on the validity of the results.

The research design controlled for many of the other threats to internal validity, such as the effects of history, maturation, testing, instrumentation, statistical regression, and selection / maturation interaction. The interaction effects threatening external validity, such as treatment and selection bias, multiple treatment interference, reactive effect of testing and treatment, etc. could not be totally controlled. Generalizability of findings from this study is very limited because the focus of evaluation is so individualized to the Calgary program. It is unlikely that other Early Intervention Programs across North America have exactly the same philosophy and idiosyncrasies of implementation as does this program.

The research design was most limited by the lack of an equivalent Control Group. This was not possible for social-ethical reasons, as well as practical ones i.e. there is no way to control for a placebo effect even if some eligible families are deprived of the program. The intent of using a Pre-Treatment Group in this study was to enable discussion of pre and post treatment levels of parenting stress. The intent of using a Control Group of families with healthy children, was to enable separation of "normal" parenting stress from that experienced by families with special needs children. Although every attempt was made to establish comparability of families across the Control, Pre-Treatment, and Treatment groups, there were problems with this approach.

Specifically, the Pre-Treatment families did not have enough time to develop the deletorious consequences of raising a handicapped child without a support program. It was difficult / impossible to measure the impact of a preventive program that was implemented prior to the development of any problems. In essence the Treatment Group families were being compared with a theoretical "worst case" family who had received little support in caring for a handicapped child, and experienced extreme parenting stress.

The use of "normal" Control Group families was not helpful in the difficult task of separating the combined effects of the program and a handicapped child on the family. Unless the program was 100% effective in preventing / correcting the stressors, Treatment Group families were found to be worse off than Control Group families. Given this situation negative program effects could not be distinguished from mildly positive, but "less than perfect" program effects.

Structural equation modeling or repeated measures could not control for the complex "peak-and-trough" evolutionary adjustment that likely occurs with parents of a handicapped child. Most theories on adaptation depict a repetitive cyclical process of denial, anger, depression, and acceptance. If this is truly the case, any mildly positive effects of Early Intervention would potentially be underestimated or deemed harmful at one time (because the natural grief process overrides them), and overestimated at another -- the net result would be to conclude the program had a mixed or neutral impact.

Apart from the limitations of design, the greatest potential problem with this study was poor causal modeling. If the wrong concepts and indicators have been selected, even a perfect design and multiple measures would fail to detect program impact. It would be erroneous then to conclude the program is ineffective, just that effects could not be demonstrated with these models.

CHAPTER IV: RESULTS AND DISCUSSION

Presentation of Descriptive / Qualitative Data

Response Rates

Treatment Group

The Treatment Group consisted of 37 eligible program families, or 74 parents. For the first wave of data collection in February 1990, 45 parents from 26 families gave consent and returned completed questionnaires (i.e. 70% of eligible families and 60% of eligible parents initially participated). This group of respondents consisted of 25 mothers, 1 foster-mother, and 19 fathers (i.e. 58% mothers and 42% fathers). 51% of parents had a child with Down Syndrome, and 49% of parents had a child with Developmental Delay.

For the second wave of data collection in July 1990, 27 parents from 16 families responded (i.e. 62% of Wave I families and 60% of Wave I parents). This set consisted of 16 mothers and 11 fathers (i.e. 59% mothers and 41% fathers). 52% of parents had a child with Down Syndrome, and 48% of parents had a child with Developmental Delay.

For the third wave of data collection in November 1990, 12 parents from 7 families responded (i.e. 44% of Wave II families and parents). This set consisted of 7 mothers and 5 fathers (i.e. 58% mothers and 42% fathers). 33% of parents had a child with Down Syndrome, and 67% of parents had a child with Developmental Delay.

Pre-Treatment Group

The Pre-Treatment Group consisted of 56 families or 112 parents, newly admitted to the program during the 1990 year. 33 parents from 19 families consented to participate in the study, and returned an initial questionnaire (i.e. 34% of eligible families and 30% of eligible parents initially responded). This group consisted of 17 mothers, 1 foster-mother, 14 fathers and 1 foster-father (i.e. 55% mothers and 45% fathers). 48% of parents had a child with Down Syndrome, and 52% had a child with Developmental Delay.

19 parents from 11 families returned a second questionnaire at either the July or November data collection time (i.e. 58% of Wave I families and parents responded). This set consisted of 10 mothers and 9 fathers (i.e. 52% mothers and 47% fathers). 53%

of parents had a child with Down Syndrome and 47% of parents had a child with Developmental Delay.

Only 2 parents from the same family completed a third questionnaire during the year; they had a child with Down Syndrome.

Control Group

The Control Group consisted of 250 families or 500 parents sampled from 20 neighbourhood day care centers. 78 parents from 48 families consented to participate in the study and returned an initial questionnaire (i.e. 19% of sampled families and 16% of sampled parents responded). This group consisted of 43 mothers, 2 surrogate mothers (grandmother and godmother), 32 fathers, and 1 step-father (i.e. 58% mothers and 42% fathers). There was representation from 18 of the 20 day care centers used to obtain this sample. See Appendix XX for a final breakdown of the communities in which the participating program and control families resided.

For the second wave of data collection during the summer of 1990, 59 parents from 35 families returned questionnaires (i.e. 73% of Wave I families and 76% of

Wave I parents responded). This group consisted of 35 mothers and 24 fathers; or 59% mothers and 41% fathers.

For the third wave of data collection during the fall of 1990, 41 parents from 24 families returned questionnaires (i.e. 69% of Wave II families and parents responded). This set consisted of 24 mothers and 17 fathers; or 59% mothers and 41% fathers.

Qualitative Data

Comments from program families were solicited in Part IV of the Family Stress and Coping Questionnaire. All of the families and most of the mothers and fathers provided written feedback about the program, at some point during the data collection year. See Appendices XXI to XXIV for their abstracted comments. (The order of comments has been deliberately scrambled, e.g. comments number five on Appendix XXI, XXII, XXIII, and XXIV are all from different families.)

Descriptive Statistics

See Appendix XXV for the coded data that were generated from the study and entered into SPSS-PC. User missing variables were coded the same as system missing variables. Means and / or frequencies were obtained for each variable, by group and sub-group.

The Pre-Treatment Group was designated EIP code 1 (CASE# 1-33 and FAMILY# 102-189). The Treatment Group was designated EIP code 2 (CASE# 34-78 and FAMILY# 201-236). The Control Group was designated EIP code 3 (CASE# 79-156 and FAMILY# 301-548). Mothers and fathers were designated respectively as 1 and 2 under the variable PARENT; foster-mother, foster-father, grandmother, stepfather, and godmother were designated 3,4,5,6, and 7 respectively. Down Syndrome was coded as 1 under the variable DIAGNOS; code 2 represents Developmental Delay.

Parent Age (PAR.AGE)

Codes 1-6 represent each of the parent age groups provided on the questionnaire.

50% of Treatment Group mothers and 79% of Treatment Group fathers were in the 30-40 year age range. 31% of mothers in this group were in the 24-29 year age range, compared with 11% of fathers. 15% of mothers and 5% of fathers were in the 18-23 year group. 4% of mothers were in the 40-50 year range.

72% of Pre-Treatment Group mothers and 67% of Pre-Treatment Group fathers were in the 30-40 year age range. 17% of mothers and 13% of fathers fell in the

24-29 year group. 11% of mothers and 7% of fathers were in the 18-23 year range. 13% of fathers in this group were 40-50 years.

In both the Treatment and Pre-Treatment Groups, parents of children with Down Syndrome and Developmental Delay were distributed equally across the age groups.

51% of Control Group mothers and 58% of Control Group fathers were in the 30-40 year age range. 33% of mothers and 39% of fathers fell in the 24-29 year group. 13% of mothers and 3% of fathers were in the 18-23 year age range. 2% of mothers in this group were 40-50 years.

Family Culture or Ethnicity (CULTURE)

This variable was coded 1-6 representing each of the categories provided on the questionnaire.

91% of Treatment Group parents reported their culture as White; 9% of these parents were North American Indian or East Indian.

91% of Pre-Treatment Group parents reported their culture as White; 9% of these parents were East Indian or Asian / Oriental.

96% of Control Group parents reported their culture as White; 4% of these parents were Asian / Oriental or North American Indian.

Family Religion (RELIGION)

This variable was coded 1-9 to represent the variety of religious denominations provided by the respondents.

16% of Treatment Group parents did not provide a religious affiliation. 31% of respondents in this group were Roman Catholic, 29% were Protestant, and 7% were LDS / Mormon. The remaining 16% were either Hindu, Jewish, Pentecostal, or non-denominational Christian.

15% of Pre-Treatment Group parents did not provide a religious affiliation. 30% of respondents in this group were Roman Catholic, 33% were Protestant, and 6% were LDS / Mormon. The remaining 18% were either Muslim or non-denominational Christian.

23% of Control Group parents did not provide a religious affiliation. 40% of respondents in this group were Roman Catholic, and 27% were Protestant. The remaining 9% were non-denominational Christian, Jewish, and Religious Science.

Religious Conviction (REL.CONV)

This variable was coded 1-3 to represent the possible answers to the question "Is Religion an Important Part of Your Family Life?".

47% of Treatment Group parents reported that religion was an important part of their family life; 24% said "No", 24% said "Somewhat", and 4% did not answer the question.

18% of Pre-Treatment Group parents reported that religion was an important part of their family life; 39% said "No", 39% said "Somewhat", and 3% did not answer the question.

14% of Control Group parents reported that religion was an important part of their family life; 46% said "No", 37% said "Somewhat", and 3% did not answer the question.

Level of Education (EDUCATN)

This variable was coded 1-6 to represent the categories of educational achievement provided on the questionnaire.

49% of Treatment Group parents reported having a university degree; 16% had a college diploma; 13% had some college or university education; 11% had a high school diploma; and 22% had some high school education.

42% of Pre-Treatment Group parents reported having a university degree; 21% had a college diploma; 18% had some college or university education; and 18% had a high school diploma.

22% of Control Group parents reported having a university degree; 22% had a college diploma; 23% reported some college or university education; 22% had a high school diploma; and 12% had some high school.

Employment Status (EMPLOYMT)

This variable was coded 1-5 to represent the five categories offered on the questionnaire. Where employment status changed throughout the year, the category reported on two out of the three waves of data collection was recorded for analysis.

53% of Treatment Group parents were employed full-time; 31% of parents were homemakers; 9% were employed part-time; and the remaining 5% of parents were either students, unemployed, or non-respondent to this item.

52% of Pre-Treatment Group parents were employed full-time; 36% of parents were homemakers; 9% were employed part-time; and the remaining 3% reported being unemployed.

76% of Control Group parents were employed full-time; 3% of parents were homemakers; 9% were employed part-time; 6% were unemployed; and 6% were students.

Marital Status (MARITAL)

This item was coded 1-6 to reflect the options provided on the questionnaire.

91% of Treatment Group parents reported being married; 2% were single; 4% were living with a friend; and 2% were divorced.

73% of Pre-Treatment Group parents reported being married; 15% were single; 6% were living with a friend; and 6% were separated.

86% of Control Group parents reported being married; 4% were single; 3% were living with a friend; 6% were separated; and 1% were divorced.

Sex of the Child (CHILDSEX)

This item was coded 1 for female and 2 for male.

49% of Treatment Group parents were reporting on a female child; 49% of parents reported on a male child; and 2% of parents did not answer this question.

42% of Pre-Treatment Group parents were reporting on a female child; and 58% of parents reported on a male child.

41% of Control Group parents reported on a female child; 53% reported on a male child; and 6% did not answer this question.

Other Young Children in Home (YOUNGSIB)

The actual reported number of other young children under the age of six years, was entered for this item. Overall this frequency may be mistakenly high, since many parents did not notice the word "other" in the question.

38% of Treatment Group parents reported having no other young children in the home; 58% had one other young child; and 4% had three other young children.

48% of Pre-Treatment Group parents reported having no other young children in the home; 39% had one other young child; 6% had two other children; and 6% had three other young children.

60% of Control Group parents reported having no other young children in the home; 36% had one other child; 3% had two other young children; and 1% did not answer the question.

Child Care Arrangements (CAREGIVE)

This item was coded 1-5 to represent the options provided on the questionnaire; code 5 meant Part-time Parent and Part-time Other (usually the other was daycare).

58% of Treatment Group parents reported their child was usually cared for by a parent or foster-parent; 9% reported that a relative cared for the child; 16% reported that a babysitter cared for the child; 9% reported that daycare was the usual caregiver; and 9% had a combination parent-other arrangement.

79% of Pre-Treatment Group parents reported their child was usually cared for by a parent or foster-parent; 6% had a relative caregiver; 9% had a babysitter; and 6% reported a combination parent-other arrangement.

10% of Control Group parents reported their child was usually cared for by a parent or foster-parent; 1% had a relative caregiver; 1% had a babysitter; 64% of parents usually used a daycare; and 23% had a combination parent-other arrangement.

Age of Child (CH.AGE 1, 2, 3)

Child age was recorded at each of the three waves of data collection. This item was coded 1-9 to represent the options provided on the questionnaire. There was no obvious confusion or error associated with the overlapping categories 8 and 9 (i.e. 37-42 months and 42-48 months -- this error on the questionnaire was detected late in the data collection year). In some cases however father and mother each reported different age groups for the same child.

The average age of Treatment Group children at Wave I was 19-24 months (33% of children fell in this range). The average age of this group at Wave II was 25-30 months (30% of children were in this range). The average age of this group at Wave III was 25-30 months (25% of children were in this category, but 33% were in the 31-36 month category).

The average age of Pre-Treatment Group children at Wave I was 7-12 months (12% of children were in this range, but 51% were in the 1-6 months category). The average age of this group at Wave II was 13-18 months (21% were in this range, but 37% were in the 7-12 months category). At Wave III the average age was calculated at 7-12 months, but this reflects only one child and family.

The average age of Control Group children at Wave I was 13-18 months (27% of children were in this category). The average age at Wave II was 19-24 months (27% of children were in this range, while 34% were in the 13-18 months category). The average age at Wave III was 25-30 months (32% of children were in this category and another 32% were in the 19-24 months range).

Four of the Control Group families had a new baby during the 1990 year. Each of these cases was handled slightly differently. Two of the families had the new baby late in the year, after they had completed two sets of questionnaires on the older child. In these cases the data on the new baby (i.e. "the youngest child") were not used. One family had the baby early enough to complete two sets of questionnaires for this child, and the initial set for the older child was not used. With the fourth family, mother completed three sets of questionnaires for the older child, father completed two sets of questionnaires for the newest baby, and all these data were used in the analysis.

Perception of Child's Handicap (HANDCAP 1, 2, 3)

Parents' perception of the severity of their child's handicap was recorded at each of the three waves of data collection. This item was coded 1-3 to represent the options provided on the questionnaire (1=Yes; 2=Not Sure; 3=No). These data (and all subsequent variables) were analyzed for mean differences among the subgroups, i.e. between fathers and mothers, and between parents of children with Down Syndrome and Developmental Delay. Refer to Table 1. Some of the program families reacted to the wording "serious handicap", commenting that it was ambiguous and inappropriate for their child who had a minor handicap.

At Wave I, 51% of Treatment Group parents reported their child did not have a serious handicap; 33% reported the child had a serious problem; 11% were unsure; and 4% did not answer the question. At Wave II, 44% reported a serious handicap; 37% denied a serious handicap; and 19% were unsure. At Wave III, 25% reported a serious handicap; 67% denied a serious problem; and 8% were unsure.

At Wave I, 42% of Pre-Treatment Group parents stated they were unsure of the severity of their child's problem; 33% thought the problem was serious; 21% thought the problem was not serious; and 3% did not respond to the item. At Wave II 21% of parents in this group reported a serious handicap; 21% denied a serious handicap; and 15% were unsure. At Wave III 50% were unsure, and 50% felt the handicap was serious.

At Wave I, 97% of Control Group parents reported no handicap; 1% thought their child had a serious problem; 1% were unsure; and 1% did not answer the question. At Wave II, 97% reported no handicap; 2% reported a serious problem; and 1% were unsure. At Wave III, 98% reported no handicap; and 2% were unsure. unsure.

In the following table (and all subsequent tables): Group T designates the entire Treatment Group, PT stands for the Pre-Treatment Group, and C represents the Control Group. T-DS and PT-DS designate the Treatment and Pre-Treatment Group parents of children with Down Syndrome. T-DD and PT-DD represent the Treatment and Pre-Treatment Group parents of children with Developmental Delay.

Table 1

Mean Scores for Perception of Handicap

Mean (SD)		Wave I	Wave II	Wave III
Group	I	2.2 (0.9)	1.9 (0.9)	2.4 (0.9)
	PT	1.9 (0.8)	2.0 (0.9)	1.5 (0.7)
	C	3.0 (0.3)	2.9 (0.3)	3.0 (0.2)
Mothers	I	2.2 (0.9)	1.9 (1.0)	2.3 (1.0)
	PT	2.1 (0.8)	2.0 (0.9)	2.0 (0.0)
	C	2.9 (0.3)	2.9 (0.4)	3.0 (0.2)
Fathers	I	2.2 (1.0)	2.0 (0.9)	2.6 (0.9)
	PT	1.8 (0.7)	2.1 (0.9)	1.0 (0.0)
	C	3.0 (0.0)	3.0 (0.0)	3.0 (0.0)
Parents	I-DS	2.1 (1.0)	1.9 (0.9)	2.0 (1.2)
	I-DD	2.3 (0.9)	2.0 (0.9)	2.6 (0.7)
	PT-DS	1.5 (0.5)	1.9 (0.9)	1.5 (0.7)
	PT-DD	2.2 (0.8)	2.0 (0.9)	no cases

Age at Entry to Early Intervention Program (ENTRYAGE)

The child's actual age in months was recorded for this variable. See Table 2 for a report of the group and subgroup means for this variable.

Time in Early Intervention Program (EIPMOS 1, 2, 3)

The length of time the child had been enrolled in the program was recorded in months, at each wave of data collection. See Table 3 for a report of the group means for this variable.

Satisfaction with Child's Progress (PROGRES 1, 2, 3)

Parent's perception and satisfaction of their child's progress in the Early Intervention Program was measured at each wave of data collection. A scale of 1-10 was used and the actual value recorded for analysis. See Table 4 for a report of the group and subgroup means.

Happy Times with the Child (HAPPYOC 1, 2, 3)

The frequency of positive parent-child experiences were recorded at each wave of data collection on program families. This variable was coded 1-5 to represent the options offered on the questionnaire. See Table 5 for a report of the group and subgroup means.

Other Programs and Services (OTHERPGM)

The number of other programs and services involved with the child was recorded. See Table 6 for a report of the group and subgroup means. This item likely had a high degree of error since two parents frequently reported a different number for the same child. Also the services offered through Alberta Children's Hospital were sometimes counted individually (e.g. speech, occupational, and physical therapies) or as one clinic (e.g. Down Syndrome Clinic) by the families.

Table 2

Mean Age at Entry to the Early Intervention Program

		Age in Months	Standard Deviation
Group	_T_	5.7	7.5
Subgroup	_T-DS_	1.3	1.0
	_T-DD_	10.2	8.6
Group	_PT_	6.6	7.2
Subgroup	_PT-DS_	1.6	1.2
	_PT-DD_	11.2	7.4

Table 3

Mean Time in Early Intervention at Data Collection

Months (SD)	Wave I	Wave II	Wave III
Group *I*	12.7 (8.7)	17.7 (9.7)	17.3 (8.0)
PT	0.9 (0.9)	5.5 (2.2)	9.5 (0.7)

Table 6

Mean Number of Other Family Programs and Services

	Average Number	Standard Deviation
Group *I*	2.8	2.0
PT	2.2	1.7
Subgroup *T-DS*	2.8	2.0
T-DD	2.8	2.0
PT-DS	2.4	1.8
PT-DD	1.9	1.7

Table 4

Mean Scores for Satisfaction with Child Progress

Mean (SD)		Wave I	Wave II	Wave III
Group	I	2.3 (1.3)	2.7 (1.4)	2.2 (1.3)
	PT	2.7 (1.7)	2.6 (1.7)	6.0 (2.8)
Mothers	I	2.2 (1.4)	2.6 (1.5)	2.4 (1.5)
	PT	2.7 (1.8)	2.6 (1.9)	8.0 (0.0)
Fathers	I	2.5 (1.3)	2.9 (1.3)	1.8 (1.0)
	PT	2.8 (1.6)	2.9 (1.7)	4.0 (0.0)
Parents	I-DS	2.5 (1.5)	2.9 (1.3)	3.0 (1.4)
	I-DD	2.1 (1.2)	2.5 (1.6)	1.7 (1.1)
	PT-DS	2.0 (1.8)	1.8 (0.9)	6.0 (2.8)
	PT-DD	3.4 (1.2)	4.2 (1.9)	no cases

Table 5

Mean Frequency of Happy Parent-Child Interactions

Mean (SD)		Wave I	Wave II	Wave III
Group	I	4.4 (0.8)	4.3 (0.7)	4.5 (0.7)
	PT	4.7 (0.5)	4.6 (0.6)	4.0 (0.0)
Mothers	I	4.2 (0.8)	4.3 (0.8)	4.3 (0.8)
	PT	4.5 (0.5)	4.4 (0.7)	4.0 (0.0)
Fathers	I	4.7 (0.7)	4.3 (0.7)	4.8 (0.5)
	PT	4.9 (0.4)	4.9 (0.4)	4.0 (0.0)
Parents	I-DS	4.6 (0.7)	4.2 (0.8)	4.8 (0.5)
	I-DD	4.3 (0.8)	4.3 (0.7)	4.3 (0.8)
	PT-DS	4.8 (0.4)	4.6 (0.7)	4.0 (0.0)
	PT-DD	4.6 (0.5)	4.7 (0.5)	no cases

Level of Family Stress (STRESS 1, 2, 3)

Parents' perception of the level of overall emotional stress on the family, was measured at each of the three waves of data collection via question II-1. This variable was coded 1-5 to correspond with the Likert Scale on the questionnaire (1=Almost Never; 5=Almost Always). See Table 7 for the mean scores on this item, by group and subgroup.

When coding the data for Parts II and III significant confusion and potential for error was noted, due to respondents' difficulties in matching the answer boxes with the correct items.

Perception of Control or Mastery (MASTERY 1, 2, 3)

Parents' perception of control or mastery over life's problems, was measured at each of the three waves of data collection via question II-2. This variable was coded 1-5 to correspond with the response scale provided on the questionnaire. See Table 8 for the mean scores on this item, by group and subgroup.

Mutuality of Family Roles (MUTUAL 1, 2, 3)

Parents' perception of the mutuality or "give and take" among adult family members, was measured at each of the three waves of data collection via question

II-3. This variable was coded 1-5 to correspond with the scale provided on the questionnaire. See Table 9 for the mean scores on this item, by group and subgroup.

Financial Security (FINSEC 1, 2, 3)

The financial security of the family was measured at each of the three waves of data collection, via question II-4. This item was used as a measure of socio-economic status, instead of asking about family income. The variable was coded 1-5 to correspond with the scale provided on the questionnaire. See Table 10 for the mean scores on this item, by group and subgroup.

Confidence in Problem-Solving Ability (PROBSOL 1, 2, 3)

Parents' confidence in their ability to solve daily problems, was measured at three times via question II-5a. This variable was coded 1-5; mean scores by group and subgroup are reported in Table 11.

Ability to Reframe Problems (REFRAME 1, 2, 3)

Parents' ability to reframe problems and thereby reduce their stressful impact, was measured at each time via question II-5b. This variable was coded 1-5;

mean scores by group and subgroup are reported in Table 12.

Use of Escape / Avoidance of Problems (ESCAPTV 1, 2, 3)

Parents' use of television time as a way to escape from problems and difficulties, was measured via question II-5c. The variable was coded 1-5; mean scores for groups and subgroups are reported in Table 13.

Reliance on God / Passivity (RELYGOD 1, 2, 3)

Parents' passivity with problems and reliance on God for solutions, was measured via question II-5d. The variable was coded 1-5; mean scores for groups and subgroups are reported in Table 14.

Use of Alcohol / Avoidance of Problems (DRINK 1, 2, 3)

Parents' use of alcohol for stress reduction, was measured at each wave via question II-5e. This variable was coded 1-5; mean scores for groups and subgroups are reported in Table 15.

Use of Informal Supports (FRIENDS 1, 2, 3)

Parents' use of informal support networks such as relatives and friends, was measured at each wave via question II-5f. This item was coded 1-5; mean scores for groups and subgroups are reported in Table 16.

Use of Formal Supports (COUNSEL 1, 2, 3)

Parents' use of formal supports and community resources during difficult times, was measured at each wave via question II-5g. This item was coded 1-5; mean scores for groups and subgroups are reported in Table 17.

When completing questions 5a-g, some parents chose only one option as their preferred coping mechanism, rather than responding to each item.

Positive Psychological Well-Being I (ACCOMP 1, 2, 3)

Parents' feeling of accomplishment was measured at three times, via question II-6a. In theory this item is one indicator of positive psychological well-being. The variable was coded 1-5; mean scores for groups and subgroups are reported in Table 18.

Positive Psychological Well-Being II (INTERST 1, 2, 3)

Parents' feeling of excitement or interest in daily events, was measured at three times via question II-6b. In theory this item is one indicator of positive psychological well-being. The variable was coded 1-5; mean scores for groups and subgroups are reported in Table 19.

Negative Psychological Well-Being I (RESTLES 1, 2, 3)

Parents' feeling of restlessness was measured at three times via question II-6c. In theory this item is one indicator of negative psychological well-being. The variable was coded 1-5; mean scores for groups and subgroups are reported in Table 20.

Negative Psychological Well-Being II (UPSET 1, 2, 3)

Parents' tendency to become upset with criticism was measured at each wave of data collection via question II-6d. In theory this item is one indicator of negative psychological well-being. The variable was coded 1-5; mean scores for groups and subgroups are reported in Table 21.

When answering questions 6a-d, some respondents chose one item as the best description of their state, rather than addressing each statement individually.

Parental Physical Health (PHYHLTH 1, 2, 3)

Parents' general feeling of physical health was recorded at each wave of data collection, via question III-1. This variable was coded 1-5 to correspond with the Likert Scale provided on the questionnaire (1=Strongly Disagree; 5=Strongly Agree). See Table 22 for a report of the means for groups and subgroups.

Reinforcement from Child (APPREC 1, 2, 3)

Parents' feeling of appreciation from the child and reinforcement for their parenting efforts, was measured at each wave of data collection via question III-2. This variable was coded 1-5; see Table 23 for a report of the mean scores for groups and subgroups.

Acceptability of Child (ACCEPT 1, 2, 3)

Parents' acceptance of their child's behaviour and personality, was measured at each time via question III-3. This variable was coded 1-5; see Table 24 for a report of the mean scores for groups and subgroups.

Demandingness of Child (DEMAND 1, 2, 3)

Parents' feeling that their child is especially difficult or demanding, was measured at three times via question III-4. The variable was coded 1-5; see Table 25 for a report of the mean scores for groups and subgroups.

Competence in Parenting Role (COMPET 1, 2, 3)

Parents' feeling of competence and enjoyment of their role with the child, was recorded at each wave of data collection via question III-5. This variable was coded 1-5; see Table 26 for a report of the mean scores for groups and subgroups.

Parent-Child Attachment (ATTACH 1, 2, 3)

Parents' perception of the child's attachment to them (and thereby their attachment to the child), was measured at each time via question III-6. This item was coded 1-5; see Table 27 for a report of the mean scores for groups and subgroups.

Restrictiveness of Parenting Role (RESTRIC 1, 2, 3)

Parents' feeling of sacrifice and restrictiveness due to the child, was recorded at each time via question III-7. This item was coded 1-5; see Table 28 for a report of the mean scores for groups and subgroups.

Depression about the Child (DEPRESS 1, 2, 3)

Parents' feelings of guilt (and thereby depression) about the child, was measured three times over the year via question III-8. The item was coded 1-5; see Table 29 for a report of the mean scores for groups and subgroups.

Marital Conflict about the Child (CONFLCT 1, 2, 3)

Parents' perception of marital discord because of the child, was measured three times via question III-9. This variable was coded 1-5; see Table 30 for a report of the mean scores for groups and subgroups.

Social Isolation in Parenting Role (ISOLATN 1, 2, 3)

Parents' feeling of isolation or "having no one to turn to" with parenting problems, was recorded at each time via question III-10. The variable was coded 1-5; see Table 31 for a report of the mean scores for groups and subgroups.

Table 7

Mean Scores for Level of Family Stress

Mean (SD)		Wave I	Wave II	Wave III
Group	*T*	2.2 (0.8)	2.4 (0.8)	2.5 (1.3)
	PT	2.4 (0.9)	2.5 (0.8)	2.0 (0.0)
	C	2.5 (0.9)	2.6 (0.9)	2.6 (0.9)
Mothers	*T*	2.1 (0.8)	2.4 (0.8)	2.6 (1.5)
	PT	2.8 (1.0)	2.8 (0.7)	2.0 (0.0)
	C	2.5 (1.0)	2.7 (0.8)	2.4 (1.0)
Fathers	*T*	2.4 (0.7)	2.5 (0.9)	2.4 (1.1)
	PT	2.1 (0.6)	2.3 (0.9)	2.0 (0.0)
	C	2.5 (0.8)	2.3 (0.9)	2.6 (0.9)
Parents	*T-DS*	2.2 (0.6)	2.2 (0.8)	1.5 (0.6)
	T-DD	2.3 (1.0)	2.6 (0.9)	3.0 (1.3)
	PT-DS	2.1 (0.6)	2.3 (0.7)	2.0 (0.0)
	PT-DD	2.8 (1.1)	2.8 (0.8)	no cases

Table 8

Mean Scores for Perception of Control or Mastery

Mean (SD)		Wave I	Wave II	Wave III
Group	*T*	2.1 (1.0)	1.9 (1.0)	2.3 (1.3)
	PT	1.9 (1.0)	1.9 (0.6)	2.0 (0.0)
	C	1.9 (0.8)	2.1 (0.9)	1.9 (0.7)
Mothers	*T*	2.0 (1.0)	2.1 (1.2)	2.3 (1.3)
	PT	2.1 (1.1)	2.1 (0.6)	2.0 (0.0)
	C	2.0 (0.8)	2.2 (0.9)	1.9 (0.8)
Fathers	*T*	2.3 (1.0)	1.6 (0.7)	2.2 (1.1)
	PT	1.8 (0.8)	1.8 (0.7)	2.0 (0.0)
	C	1.9 (0.9)	2.0 (0.7)	1.8 (0.7)
Parents	*T-DS*	2.2 (0.8)	1.7 (0.7)	1.8 (1.0)
	T-DD	2.0 (1.2)	2.1 (1.3)	2.5 (1.4)
	PT-DS	1.8 (0.9)	2.0 (0.7)	2.0 (0.0)
	PT-DD	2.1 (1.1)	1.9 (0.6)	no cases

Table 9

Mean Scores for Mutuality of Family Roles

Mean (SD)		Wave I	Wave II	Wave III
Group	I	1.8 (1.0)	1.7 (1.0)	2.2 (1.3)
	PT	1.7 (1.2)	1.4 (0.7)	1.0 (0.0)
	C	1.8 (1.0)	2.0 (1.1)	2.0 (1.1)
Mothers	I	1.8 (1.0)	1.7 (0.9)	2.3 (1.5)
	PT	2.1 (1.4)	1.4 (0.7)	1.0 (0.0)
	C	1.9 (1.0)	2.1 (1.2)	1.9 (1.3)
Fathers	I	1.8 (1.0)	1.7 (1.0)	2.0 (1.2)
	PT	1.4 (0.7)	1.4 (0.7)	1.0 (0.0)
	C	1.7 (0.9)	1.9 (0.9)	2.1 (1.0)
Parents	T-DS	1.8 (0.8)	1.3 (0.6)	1.3 (0.5)
	T-DD	1.8 (1.1)	2.2 (1.1)	2.6 (1.4)
	PT-DS	1.4 (0.9)	1.4 (0.8)	1.0 (0.0)
	PT-DD	2.0 (1.4)	1.4 (0.5)	no cases

Table 10

Mean Scores for Financial Security

Mean (SD)		Wave I	Wave II	Wave III
Group	T	4.0 (1.3)	4.3 (1.0)	3.5 (1.4)
	PT	4.3 (1.1)	4.2 (1.2)	5.0 (0.0)
	C	3.7 (1.4)	3.8 (1.4)	3.9 (1.2)
Mothers	T	4.1 (1.2)	4.3 (0.9)	4.1 (0.9)
	PT	4.4 (1.0)	4.6 (0.7)	5.0 (0.0)
	C	3.7 (1.5)	3.7 (1.4)	3.8 (1.2)
Fathers	T	3.8 (1.5)	4.3 (1.0)	2.6 (1.5)
	PT	4.2 (1.3)	4.0 (1.6)	5.0 (0.0)
	C	3.8 (1.4)	4.2 (1.2)	3.8 (1.2)
Parents	T-DS	4.3 (1.1)	4.5 (0.8)	3.0 (2.3)
	T-DD	3.6 (1.4)	4.1 (1.1)	3.8 (0.7)
	PT-DS	4.3 (0.9)	4.4 (1.0)	5.0 (0.0)
	PT-DD	4.4 (1.3)	4.0 (1.5)	no cases

Table 11

Mean Scores for Confidence with Problem-Solving

Mean (SD)		Wave I	Wave II	Wave III
Group	*T*	4.3 (1.0)	4.4 (0.9)	4.6 (0.7)
	PT	4.5 (0.9)	4.5 (0.8)	5.0 (0.0)
	C	4.3 (0.9)	4.3 (0.9)	4.4 (0.8)
Mothers	*T*	4.4 (1.0)	4.4 (0.9)	4.7 (0.5)
	PT	4.2 (1.1)	4.4 (0.7)	5.0 (0.0)
	C	4.2 (0.9)	4.4 (0.8)	4.5 (0.7)
Fathers	*T*	4.1 (1.1)	4.5 (0.9)	4.5 (1.0)
	PT	4.7 (0.6)	4.4 (0.9)	5.0 (0.0)
	C	4.3 (0.9)	4.4 (0.8)	4.3 (1.0)
Parents	*T-DS*	4.5 (0.9)	4.7 (0.6)	4.7 (0.6)
	T-DD	4.1 (1.2)	4.2 (1.1)	4.6 (0.7)
	PT-DS	4.6 (0.8)	4.6 (0.8)	5.0 (0.0)
	PT-DD	4.3 (1.1)	4.3 (0.7)	no cases

Table 12

Mean Scores for Ability to Reframe Problems

Mean (SD)		Wave I	Wave II	Wave III
Group	I	4.1 (0.9)	4.1 (0.9)	3.9 (0.9)
	PT	4.3 (0.9)	4.4 (0.7)	5.0 (0.0)
	C	3.9 (0.9)	3.9 (0.9)	3.7 (0.9)
Mothers	I	4.2 (0.9)	4.1 (0.9)	3.9 (0.7)
	PT	4.1 (1.1)	4.3 (0.7)	5.0 (0.0)
	C	4.0 (0.9)	3.9 (0.9)	4.0 (0.9)
Fathers	I	4.0 (0.9)	4.2 (1.0)	4.0 (1.4)
	PT	4.5 (0.7)	4.3 (0.7)	5.0 (0.0)
	C	3.8 (1.0)	3.8 (0.8)	3.5 (0.8)
Parents	I-DS	4.2 (0.9)	4.1 (0.9)	4.7 (0.6)
	I-DD	4.0 (0.9)	4.1 (1.0)	3.6 (0.9)
	PT-DS	4.5 (0.7)	4.9 (0.3)	5.0 (0.0)
	PT-DD	4.2 (1.1)	3.9 (0.6)	no cases

Table 13

Mean Scores for Escape / Avoidance of Problems

Mean (SD)		Wave I	Wave II	Wave III
Group	*T*	2.0 (0.9)	1.8 (0.9)	2.2 (0.9)
	PT	1.8 (1.1)	1.8 (0.9)	1.0 (0.0)
	C	2.0 (1.0)	2.0 (1.0)	2.1 (1.1)
Mothers	*T*	2.0 (1.0)	1.9 (1.0)	2.0 (1.0)
	PT	1.9 (1.0)	1.7 (0.7)	1.0 (0.0)
	C	2.0 (0.9)	1.9 (1.1)	1.9 (1.0)
Fathers	*T*	2.0 (0.8)	1.7 (0.8)	2.4 (0.9)
	PT	1.8 (1.2)	1.9 (1.1)	1.0 (0.0)
	C	2.0 (1.1)	2.1 (1.0)	2.5 (1.1)
Parents	*T-DS*	2.0 (1.0)	1.5 (0.7)	1.3 (0.5)
	T-DD	2.0 (0.9)	2.2 (1.1)	2.6 (0.7)
	PT-DS	1.3 (0.5)	1.6 (0.7)	1.0 (0.0)
	PT-DD	2.0 (0.9)	2.0 (1.0)	no cases

Table 14

Mean Scores for Passivity / Reliance on God

Mean (SD)		Wave I	Wave II	Wave III
Group	T	2.7 (1.6)	2.6 (1.5)	1.7 (1.0)
	PT	2.2 (1.5)	2.5 (1.6)	2.0 (0.0)
	C	1.9 (1.3)	2.0 (1.3)	2.0 (1.3)
Mothers	T	2.7 (1.6)	2.4 (1.3)	1.7 (1.1)
	PT	2.1 (1.3)	2.3 (1.4)	2.0 (0.0)
	C	2.2 (1.4)	2.4 (1.4)	2.2 (1.3)
Fathers	T	2.6 (1.6)	2.8 (1.7)	1.6 (0.9)
	PT	2.0 (1.5)	2.4 (1.8)	2.0 (0.0)
	C	1.6 (1.1)	1.5 (0.9)	1.8 (1.2)
Parents	T-DS	2.4 (1.6)	2.7 (1.5)	1.3 (0.5)
	T-DD	3.0 (1.6)	2.5 (1.5)	1.9 (1.1)
	PT-DS	2.3 (1.6)	3.2 (1.8)	2.0 (0.0)
	PT-DD	2.1 (1.5)	1.8 (1.1)	no cases

Table 15

Mean Scores for Use of Alcohol / Avoidance of Problems

Mean (SD)		Wave I	Wave II	Wave III
Group	*T*	1.2 (0.5)	1.5 (0.9)	1.5 (0.7)
	PT	1.3 (0.9)	1.3 (0.7)	1.0 (0.0)
	C	1.5 (0.8)	1.4 (0.8)	1.4 (0.7)
Mothers	*T*	1.2 (0.4)	1.2 (0.4)	1.4 (0.5)
	PT	1.4 (1.0)	1.2 (0.4)	1.0 (0.0)
	C	1.4 (0.7)	1.4 (0.8)	1.2 (0.4)
Fathers	*T*	1.3 (0.6)	1.9 (1.2)	1.6 (0.9)
	PT	1.4 (0.8)	1.4 (0.9)	1.0 (0.0)
	C	1.6 (0.9)	1.4 (0.7)	1.4 (0.7)
Parents	*T-DS*	1.2 (0.5)	1.3 (0.5)	1.3 (0.5)
	T-DD	1.2 (0.4)	1.7 (1.2)	1.6 (0.7)
	PT-DS	1.2 (0.6)	1.4 (0.7)	1.0 (0.0)
	PT-DD	1.5 (1.1)	1.2 (0.7)	no cases

Table 16

Mean Scores for Use of Informal Supports

Mean (SD)		Wave I	Wave II	Wave III
Group	T	3.4 (1.1)	3.1 (0.9)	3.3 (1.0)
	PT	3.7 (1.1)	3.3 (1.3)	4.0 (0.0)
	C	2.5 (1.1)	2.4 (1.2)	2.2 (0.9)
Mothers	T	3.6 (1.1)	3.2 (0.9)	3.3 (1.0)
	PT	3.9 (1.1)	3.6 (1.0)	4.0 (0.0)
	C	2.8 (1.2)	2.6 (1.3)	2.3 (0.9)
Fathers	T	3.2 (1.2)	3.1 (1.0)	3.2 (1.1)
	PT	3.3 (1.2)	2.9 (1.6)	4.0 (0.0)
	C	2.1 (0.9)	2.1 (0.9)	1.9 (0.9)
Parents	T-DS	3.3 (1.3)	3.1 (1.0)	2.8 (0.5)
	T-DD	3.5 (0.9)	3.2 (0.9)	3.6 (1.1)
	PT-DS	3.9 (0.9)	3.1 (1.4)	4.0 (0.0)
	PT-DD	3.5 (1.3)	3.4 (1.2)	no cases

Table 17

Mean Scores for Use of Formal Supports

Mean (SD)		Wave I	Wave II	Wave III
Group	T	1.5 (0.9)	1.4 (0.9)	1.7 (1.3)
	PT	1.9 (1.1)	2.1 (1.1)	2.5 (0.7)
	C	1.3 (0.7)	1.3 (0.8)	1.2 (0.6)
Mothers	T	1.5 (1.1)	1.5 (1.1)	1.9 (1.5)
	PT	2.2 (1.3)	2.0 (0.9)	3.0 (0.0)
	C	1.4 (0.8)	1.5 (1.1)	1.4 (0.8)
Fathers	T	1.5 (0.8)	1.3 (0.7)	1.5 (1.0)
	PT	1.8 (1.0)	2.2 (1.4)	2.0 (0.0)
	C	1.2 (0.5)	1.1 (0.3)	1.0 (0.0)
Parents	T-DS	1.4 (0.7)	1.2 (0.4)	1.0 (0.0)
	T-DD	1.6 (1.1)	1.7 (1.3)	2.1 (1.5)
	PT-DS	2.0 (1.2)	2.2 (1.3)	2.5 (0.7)
	PT-DD	1.9 (1.1)	2.0 (0.9)	no cases

Table 18

Mean Score for Positive Psychological Well-Being I

Mean (SD)		Wave I	Wave II	Wave III
Group	T	3.8 (0.9)	3.9 (0.9)	3.6 (0.8)
	PT	3.5 (0.9)	3.5 (1.1)	4.0 (0.0)
	C	3.2 (1.1)	3.3 (1.1)	3.4 (0.9)
Mothers	T	3.9 (0.9)	3.8 (0.8)	3.3 (0.8)
	PT	3.5 (0.9)	3.1 (1.5)	4.0 (0.0)
	C	3.1 (1.2)	3.2 (1.2)	3.4 (1.0)
Fathers	T	3.7 (1.0)	4.0 (1.0)	4.0 (0.7)
	PT	3.7 (0.7)	4.0 (0.5)	4.0 (0.0)
	C	3.3 (0.9)	3.6 (1.0)	3.4 (0.9)
Parents	T-DS	3.5 (0.8)	4.0 (0.9)	3.8 (1.0)
	T-DD	4.1 (0.9)	3.7 (0.9)	3.5 (0.8)
	PT-DS	3.7 (0.8)	3.8 (0.9)	4.0 (0.0)
	PT-DD	3.4 (0.9)	3.2 (1.3)	no cases

Table 19

Mean Scores for Positive Psychological Well-Being II

Mean (SD)		Wave I	Wave II	Wave III
Group	*T*	3.7 (0.9)	3.7 (0.7)	3.4 (0.7)
	PT	3.5 (0.9)	3.8 (0.8)	4.0 (0.0)
	C	3.3 (1.0)	3.5 (1.1)	3.4 (1.0)
Mothers	*T*	3.5 (0.9)	3.6 (0.6)	3.7 (0.5)
	PT	3.4 (1.0)	3.6 (0.9)	4.0 (0.0)
	C	3.2 (1.0)	3.3 (1.1)	3.5 (1.0)
Fathers	*T*	3.8 (0.9)	3.9 (0.7)	3.0 (0.7)
	PT	3.8 (0.8)	3.9 (0.6)	4.0 (0.0)
	C	3.4 (0.9)	3.9 (0.9)	3.2 (0.9)
Parents	*T-DS*	3.5 (0.9)	3.9 (0.8)	3.5 (0.6)
	T-DD	3.8 (0.9)	3.5 (0.5)	3.4 (0.7)
	PT-DS	3.5 (1.0)	3.7 (0.7)	4.0 (0.0)
	PT-DD	3.5 (0.9)	3.9 (0.9)	no cases

Table 20

Mean Scores for Negative Psychological Well-Being I

Mean (SD)		Wave I	Wave II	Wave III
Group	*T*	1.8 (1.0)	2.0 (1.3)	2.3 (1.5)
	PT	2.2 (1.2)	2.6 (1.6)	1.5 (0.7)
	C	2.3 (1.2)	2.3 (1.1)	2.2 (1.1)
Mothers	*T*	1.7 (0.9)	1.8 (1.2)	2.1 (1.5)
	PT	1.9 (1.1)	2.4 (1.6)	1.0 (0.0)
	C	2.4 (1.2)	2.4 (1.1)	2.2 (1.2)
Fathers	*T*	1.8 (1.0)	2.5 (1.4)	2.4 (1.7)
	PT	2.7 (1.2)	3.0 (1.6)	2.0 (0.0)
	C	2.1 (1.1)	2.1 (1.2)	2.1 (1.2)
Parents	*T-DS*	1.6 (0.9)	2.1 (1.5)	3.3 (2.1)
	T-DD	2.0 (1.0)	1.9 (1.0)	1.8 (0.9)
	PT-DS	2.1 (1.0)	2.5 (1.8)	1.5 (0.7)
	PT-DD	2.3 (1.3)	2.8 (1.4)	no cases

Table 21

Mean Scores for Negative Psychological Well-Being II

Mean (SD)		Wave I	Wave II	Wave III
Group	I	2.0 (0.9)	2.1 (0.9)	2.1 (1.1)
	PT	1.8 (1.0)	1.9 (0.8)	1.5 (0.7)
	C	1.8 (0.9)	1.9 (1.0)	1.6 (0.8)
Mothers	I	1.9 (0.7)	2.0 (0.9)	2.0 (1.2)
	PT	1.9 (1.2)	1.8 (0.8)	1.0 (0.0)
	C	1.9 (1.0)	2.1 (1.0)	1.7 (0.8)
Fathers	I	2.1 (1.1)	2.2 (0.9)	2.2 (1.1)
	PT	1.7 (0.8)	2.1 (0.8)	2.0 (0.0)
	C	1.7 (0.9)	1.6 (0.9)	1.4 (0.6)
Parents	T-DS	1.9 (0.8)	1.9 (0.7)	2.3 (0.5)
	T-DD	2.0 (1.0)	2.3 (1.0)	2.0 (1.3)
	PT-DS	1.3 (0.5)	1.4 (0.5)	1.5 (0.7)
	PT-DD	2.2 (1.1)	2.4 (0.7)	no cases

Table 22

Mean Scores for Parental Physical Health

Mean (SD)		Wave I	Wave II	Wave III
Group	T	4.1 (0.8)	4.1 (0.9)	4.2 (0.9)
	PT	3.9 (1.1)	4.0 (0.9)	4.0 (0.0)
	C	4.0 (1.0)	3.9 (1.0)	3.7 (1.1)
Mothers	T	4.0 (0.9)	3.9 (0.9)	4.1 (1.1)
	PT	3.6 (1.3)	3.6 (1.1)	4.0 (0.0)
	C	3.9 (1.0)	3.9 (0.9)	3.7 (1.3)
Fathers	T	4.3 (0.7)	4.5 (0.5)	4.3 (0.5)
	PT	4.1 (0.9)	4.3 (0.7)	4.0 (0.0)
	C	4.2 (0.9)	4.0 (1.1)	3.8 (1.0)
Parents	T-DS	4.2 (0.8)	4.3 (0.5)	4.8 (0.5)
	T-DD	4.0 (0.9)	3.9 (1.2)	3.9 (0.9)
	PT-DS	4.1 (1.0)	4.1 (1.1)	4.0 (0.0)
	PT-DD	3.7 (1.2)	3.9 (0.8)	no cases

Table 23

Mean Scores for Reinforcement from Child

Mean (SD)		Wave I	Wave II	Wave III
Group	I	4.4 (0.6)	4.4 (0.5)	4.3 (0.7)
	PT	4.4 (0.7)	4.2 (0.9)	4.0 (0.0)
	C	4.1 (0.7)	4.1 (0.8)	4.1 (0.7)
Mothers	I	4.5 (0.6)	4.4 (0.5)	4.3 (0.8)
	PT	4.5 (0.7)	4.2 (1.0)	4.0 (0.0)
	C	4.2 (0.6)	4.1 (0.8)	4.3 (0.7)
Fathers	I	4.4 (0.5)	4.5 (0.5)	4.4 (0.5)
	PT	4.4 (0.5)	4.3 (0.7)	4.0 (0.0)
	C	4.1 (0.6)	4.1 (0.7)	4.0 (0.6)
Parents	T-DS	4.3 (0.5)	4.3 (0.5)	4.5 (0.6)
	T-DD	4.5 (0.7)	4.6 (0.5)	4.3 (0.7)
	PT-DS	4.4 (0.7)	4.0 (1.1)	4.0 (0.0)
	PT-DD	4.4 (0.7)	4.4 (0.5)	no cases

Table 24

Mean Scores for Acceptability of Child

Mean (SD)		Wave I	Wave II	Wave II
Group	T	2.5 (1.2)	3.0 (1.2)	2.7 (1.4)
	PT	2.0 (1.0)	1.9 (1.8)	2.0 (0.0)
	C	2.8 (1.2)	3.0 (1.2)	3.1 (1.1)
Mothers	T	2.6 (1.3)	3.0 (1.3)	2.7 (1.6)
	PT	2.1 (1.1)	2.0 (1.2)	2.0 (0.0)
	C	2.9 (1.3)	3.0 (1.2)	3.1 (1.2)
Fathers	T	2.3 (1.1)	3.0 (1.2)	2.6 (1.3)
	PT	2.1 (1.0)	2.0 (1.2)	2.0 (0.0)
	C	2.7 (1.2)	3.0 (1.3)	3.1 (1.0)
Parents	T-DS	2.6 (1.3)	3.1 (1.1)	3.5 (1.0)
	T-DD	2.4 (1.2)	2.9 (1.3)	2.3 (1.5)
	PT-DS	1.5 (0.7)	1.7 (0.9)	2.0 (0.0)
	PT-DD	2.5 (1.1)	2.2 (1.4)	no cases

Table 25

Mean Scores for Demandingness of Child

Mean (SD)		Wave I	Wave II	Wave III
Group	*T*	2.1 (1.2)	2.3 (1.2)	2.3 (1.4)
	PT	1.9 (1.2)	1.8 (0.9)	2.0 (0.0)
	C	1.7 (0.9)	1.7 (1.0)	1.7 (0.9)
Mothers	*T*	1.9 (1.1)	2.3 (1.3)	2.4 (1.5)
	PT	1.9 (1.3)	1.7 (0.9)	2.0 (0.0)
	C	1.7 (0.9)	1.6 (0.9)	1.6 (0.7)
Fathers	*T*	2.2 (1.2)	2.4 (1.0)	2.2 (1.3)
	PT	1.9 (1.0)	2.0 (0.9)	2.0 (0.0)
	C	1.6 (0.8)	1.9 (1.1)	1.8 (1.0)
Parents	*T-DS*	1.8 (0.9)	2.4 (1.0)	2.5 (1.7)
	T-DD	2.5 (1.4)	2.2 (1.4)	2.3 (1.3)
	PT-DS	1.4 (0.6)	1.7 (0.8)	2.0 (0.0)
	PT-DD	2.3 (1.4)	1.9 (0.9)	no cases

Table 26

Mean Scores for Competence in Parenting Role

Mean (SD)		Wave I	Wave II	Wave III
Group	*I*	4.7 (0.5)	4.5 (0.8)	4.8 (0.4)
	PT	4.8 (0.4)	4.7 (0.5)	4.0 (0.0)
	C	4.8 (0.7)	4.7 (0.8)	4.9 (0.4)
Mothers	*I*	4.7 (0.6)	4.4 (0.8)	4.9 (0.4)
	PT	4.8 (0.4)	4.7 (0.5)	4.0 (0.0)
	C	4.8 (0.7)	4.8 (0.5)	5.0 (0.2)
Fathers	*I*	4.7 (0.5)	4.5 (0.7)	4.8 (0.4)
	PT	4.7 (0.5)	4.8 (0.4)	4.0 (0.0)
	C	4.7 (0.6)	4.5 (1.2)	4.8 (0.4)
Parents	*I-DS*	4.6 (0.6)	4.4 (0.9)	4.8 (0.5)
	I-DD	4.8 (0.5)	4.5 (0.7)	4.9 (0.4)
	PT-DS	4.6 (0.5)	4.6 (0.5)	4.0 (0.0)
	PT-DD	4.9 (0.2)	4.9 (0.3)	no cases

Table 27

Mean Scores for Parent-Child Attachment

Mean (SD)		Wave I	Wave II	Wave III
Group	T	4.1 (1.1)	3.9 (1.0)	3.6 (1.4)
	PT	3.8 (1.1)	3.8 (1.2)	3.0 (1.4)
	C	4.1 (1.1)	4.0 (1.0)	4.1 (0.8)
Mothers	T	4.3 (1.0)	4.1 (1.0)	3.6 (1.5)
	PT	3.9 (1.3)	3.5 (1.3)	4.0 (0.0)
	C	4.2 (1.1)	4.1 (1.0)	4.3 (0.7)
Fathers	T	3.8 (1.1)	3.5 (0.9)	3.6 (1.5)
	PT	3.6 (1.0)	4.1 (1.1)	2.0 (0.0)
	C	3.9 (0.9)	3.9 (0.9)	3.9 (1.0)
Parents	T-DS	3.8 (1.1)	3.6 (1.2)	2.3 (1.5)
	T-DD	4.5 (1.0)	4.2 (0.7)	4.3 (0.9)
	PT-DS	3.9 (0.9)	3.8 (1.1)	3.0 (1.4)
	PT-DD	3.6 (1.3)	3.9 (1.3)	no cases

Table 28

Mean Scores for Restrictiveness of Parenting Role

Mean (SD)		Wave I	Wave II	Wave III
Group	T	2.8 (1.3)	2.7 (1.2)	2.5 (1.6)
	PT	2.5 (1.3)	2.9 (1.2)	2.0 (0.0)
	C	2.7 (1.3)	2.9 (1.2)	2.6 (1.2)
Mothers	T	3.0 (1.4)	2.7 (1.3)	2.9 (1.8)
	PT	2.8 (1.3)	3.0 (1.0)	2.0 (0.0)
	C	2.6 (1.3)	2.8 (1.1)	2.5 (1.2)
Fathers	T	2.5 (1.1)	2.6 (1.1)	2.0 (1.2)
	PT	2.1 (1.2)	3.0 (1.5)	2.0 (0.0)
	C	2.8 (1.2)	2.8 (1.3)	2.6 (1.3)
Parents	T-DS	2.5 (0.9)	2.5 (1.1)	1.5 (0.6)
	T-DD	3.2 (1.5)	2.8 (1.3)	3.0 (1.7)
	PT-DS	2.2 (1.2)	3.0 (1.1)	2.0 (0.0)
	PT-DD	2.7 (1.3)	2.9 (1.5)	no cases

Table 29

Mean Scores for Depression About Child

Mean (SD)		Wave I	Wave II	Wave III
Group	T	1.8 (1.1)	1.9 (1.0)	1.4 (0.7)
	PT	1.5 (0.8)	1.4 (0.6)	1.5 (0.7)
	C	1.5 (0.8)	1.6 (0.7)	1.7 (1.0)
Mothers	T	1.8 (0.9)	2.1 (1.2)	1.6 (0.8)
	PT	1.6 (0.9)	1.4 (0.7)	2.0 (0.0)
	C	1.5 (0.7)	1.7 (0.8)	1.8 (1.2)
Fathers	T	1.7 (1.0)	1.5 (0.5)	1.2 (0.4)
	PT	1.4 (0.6)	1.4 (0.5)	1.0 (0.0)
	C	1.5 (0.6)	1.4 (0.6)	1.5 (0.6)
Parents	T-DS	1.6 (0.8)	1.7 (0.8)	1.3 (0.5)
	T-DD	2.0 (1.3)	2.0 (1.2)	1.5 (0.8)
	PT-DS	1.3 (0.5)	1.7 (0.7)	1.5 (0.7)
	PT-DD	1.6 (0.9)	1.1 (0.3)	no cases

Table 30

Mean Scores for Marital Conflict About Child

Mean (SD)		Wave I	Wave II	Wave III
Group	*I*	1.7 (1.1)	2.0 (1.2)	2.0 (1.1)
	PT	1.6 (1.0)	1.7 (1.1)	2.0 (0.0)
	C	2.0 (1.2)	2.2 (1.3)	2.0 (1.1)
Mothers	*I*	1.8 (1.2)	2.0 (1.2)	2.1 (1.1)
	PT	1.6 (0.9)	1.7 (1.1)	2.0 (0.0)
	C	1.9 (1.2)	2.1 (1.3)	2.0 (0.0)
Fathers	*I*	1.7 (0.9)	2.0 (1.3)	1.8 (1.3)
	PT	1.7 (1.1)	1.9 (1.3)	2.0 (0.0)
	C	2.1 (1.3)	2.2 (1.3)	2.1 (1.1)
Parents	*T-DS*	1.5 (0.8)	2.0 (1.2)	1.3 (0.5)
	T-DD	1.9 (1.3)	2.0 (1.2)	2.4 (1.2)
	PT-DS	1.3 (0.5)	1.3 (0.5)	2.0 (0.0)
	PT-DD	1.9 (1.2)	2.2 (1.5)	no cases

Table 31

Mean Scores for Social Isolation in Parenting Role

Mean (SD)		Wave I	Wave II	Wave III
Group	*T*	4.2 (0.8)	4.4 (0.7)	4.7 (0.5)
	PT	4.2 (1.2)	4.3 (0.6)	4.0 (0.0)
	C	4.1 (1.0)	4.0 (0.9)	4.1 (0.9)
Mothers	*T*	4.2 (0.9)	4.5 (0.5)	4.7 (0.5)
	PT	4.2 (1.1)	4.4 (0.5)	4.0 (0.0)
	C	4.2 (0.9)	4.1 (1.0)	4.1 (1.0)
Fathers	*T*	4.2 (0.8)	4.2 (0.9)	4.6 (0.5)
	PT	4.0 (1.2)	4.1 (0.6)	4.0 (0.0)
	C	4.1 (0.9)	3.9 (0.9)	4.1 (0.8)
Parents	*T-DS*	4.1 (0.9)	4.5 (0.5)	4.5 (0.6)
	T-DD	4.3 (0.7)	4.2 (0.8)	4.8 (0.5)
	PT-DS	4.4 (1.0)	4.3 (0.7)	4.0 (0.0)
	PT-DD	3.9 (1.2)	4.3 (0.5)	no cases

Interpretation of Qualitative / Descriptive Data

Analysis of Response Rates

Treatment Group

The initial response rate of 60-70% from the Treatment Group families was quite good, considering these parents were committing themselves to a year long data collection process. From the perspective of the Early Intervention Program staff there was no participation or drop-out bias in this sample, with respect to psychosocial circumstances, complexity of child's condition, parent satisfaction with the program, etc. The ratio of participating mothers to fathers was slightly higher than the real program population; but the proportion of families of children with Down Syndrome versus Developmental Delay was realistic until the third wave.

Pre-Treatment Group

The 30% rate of participation in the Pre-Treatment Group was disappointing, but likely had much to do with the families' initial adjustment to not only a new baby, but a special needs child as well. Few families in this group would have developed a strong committment, or sense of investment in the program.

Although the program staff could not detect differential participation or drop-out in this group, it is questionable that the sample was representative beyond the first wave of data collection. Certainly few judgements could be made on the third wave with only one family participating.

When follow-up phone calls were made to the program families who had consented to participate but did not return a questionnaire, most said they "were too busy to continue", "had forgotten but would send it soon", or "had put it in the mail already". The possibility of some questionnaires being lost in the mailing process also cannot be excluded.

Control Group

The low rate of participation among Control Group families, i.e. 19%, was expected since these parents had nothing to gain by completing the questionnaires. The majority of parents who consented to participate in the beginning, continued with the data collection process throughout the year.

This sample was likely not representative of young child-bearing families residing in Calgary (despite the sampling methodology), since families who consented to participate in such a study were probably very different on a number of undetermined variables than those families who ignored the request for volunteers. There was no clear basis however, on which to verify differential participation or drop-out in this group.

Analysis of Qualitative Data

What Families Find Helpful About the Program

Most of the families of children with Down Syndrome did not actively seek and choose to become involved with the Early Intervention Program. It was a community service offered to them shortly after the birth of their baby, and they had not felt a need to turn away the service. Families of children with Developmental Delay usually became involved after a period of questionning and actively seeking advice about their child, from a physician or community health nurse. Families of children with Down Syndrome perhaps viewed their association with the program as being potentially more longterm, than those families of children with Developmental Delay.

Despite these initial differences between the two groups of families, their reasons for staying with the program were very similar. Most parents emphasized the support and information components of the program. It was important for them to have validation about their child's problems / abilities, and reassurance they were doing everything possible to maximize his / her developmental potential. The exercise routines gave some concrete focus for their interaction with the child, and the staff member's knowledge about other resources saved them from having to seek and find for themselves.

Some parents commented on the helpfulness of a consistent staff member to monitor the child's progress; the convenience / flexibility of in-home visits, and the loaning of toys. These themes however, were clearly secondary in importance to the support and information needs the program was fulfilling.

The occasional parent seemed to expect the program would "make the child normal". There were no variables e.g. staff member, child's diagnosis, parent education, etc., clearly associated with the few families who held this somewhat unrealistic belief.

Families' Suggestions for Improving the Service

The majority of parents were very pleased with the service they received from Calgary's Early Intervention

Program, and had few suggestions for improvement.

Fewer than 10% of the families were having some difficulties working with the program. These parents commented on the need for: a higher public profile; "better" administrative / office staff (? more sensitive, flexible, organized); continued home visits after referral to a therapy program; more regular / frequent visits; greater selection and variety in toys and equipment; continuation of the swimming program; new methods and techniques for stimulating the child; a staff physiotherapist and occupational therapist; greater staff expertise and specialization with specific handicaps; increased linkage and coordination with other programs offered in the city; and improved parent-staff communication, sensitivity, and therapeutic listening skills. Again there were no variables clearly associated with the few families who expressed some discontent with the program.

Parent-Child Changes Attributed to the Program

The families who were admitted to the program soon after the birth of their baby, had trouble detecting a change per se in their child. For these families the value of the program was in prevention of potential problems. Some of the parents commented on their child's steady developmental progress, but could not distinguish natural progress from change brought about by the program. Other families could attribute dramatic developmental leaps to the suggestions and exercises offered by the program. Many families were struggling with the various labels and diagnoses applied to their child, and the prospect of longterm involvement with a variety of professionals and therapy programs. Although a few parents were feeling some loss of control, most commented on positive changes in their attitude, feelings, and expectations of the child since joining this program. Many parents viewed the program staff member as an integral part of their family dynamics.

Analysis of Descriptive Data

Profile of the Average Treatment Group Family

The typical Treatment Group family consisted of a white, married couple in the 30-40 year age range, with two children under the age of 6 years. The average family was Roman Catholic, and felt their religion was an important part of family life. Parents in this typical family were university educated, with the father employed full-time and the mother at home caring for young children.

The average age of this couple's child, who was enrolled in the Early Intervention Program, was 19-30 months. This typical child had an equal chance of being male or female, and an equal chance of having Down Syndrome or Developmental Delay.

The Family of a Child with Down Syndrome

The average Treatment Group family of a child with Down Syndrome, had been with the program since their baby was 5-6 weeks old, i.e. for the past 12-18 months. Parents of this child were typically unsure about the severity of their baby's handicap -- sometimes thinking it was a serious problem, and other times believing it not. This typical family was involved with three programs other than Early Intervention, to help their child. Overall, the mother and father were pleased with the progress their child was making in the Early Intervention Program, and reported having mostly happy times together.

This average Treatment Group family of a child with Down Syndrome, felt they were under a lot of family stress only "once in awhile" throughout the year

--"almost never" by year end. They reported that "once in awhile" they felt out of control, over the direction their lives were taking. This family reported mutuality between adult members was an issue "once in a while" early in the year, but "almost never" a problem for the remainder of the time. Money was occasionally a problem for this family especially toward year end, when they reported having enough for necessities only "sometimes", at that point. This couple "almost always" had faith in their problem-solving abilities, and "frequently" used reframing as a way to cope with stressful events. "Once in awhile" they used television as an escape from their problems, but "almost never" toward year end. They "sometimes" relied on God to help them with problems, but again this happened less often toward year end. This couple reported they "almost never" used alcohol as a way to cope with family difficulties. The typical Treatment Group family of a child with Down Syndrome "sometimes" shared their problems with relatives and friends, and "almost never" sought professional counsel for family stresses. This couple reported they "frequently" felt pleased with their accomplishments, and interested in excited by daily events. They reported increasing feelings of restlessness over the year, and "once in awhile" becoming upset with others' criticism.

The average Treatment Group couple with a child having Down Syndrome, felt in good physical health for the past year -- especially at year end. They felt their child appreciated and reinforced their parenting efforts. There were a few things about their child that bothered them a great deal -- this feeling increased over the year, although they felt he / she was no more difficult to care for than other children. Both the mother and father enjoyed their role as parents to this child. They usually felt their child held a special attachment for them, although toward year end they weren't as sure in this perception. These parents were unsure if they were giving up more of their lives for this child, than they had previously expected, although by year end they thought probably not. Neither parent felt guilty about their feelings toward this child, and neither thought marital conflicts had increased because of the child. This couple agreed they had enough people to whom they could talk about parenting issues.

The Family of a Child with Developmental Delay

The average Treatment Group family of a child with Developmental Delay had been part of the Early Intervention Program since their baby was 10 months old, i.e. for the past 12-18 months. For the most part these parents were unsure of the severity of their child's problem, but were inclined to think it not too serious. This typical family was involved with three other specialty programs to help their child's development. Overall they were very pleased with the progress he / she was making in the Early Intervention Program, and reported mostly positive interactions with their child.

The average Treatment Group family of a child with Developmental Delay reported their family was under a lot of emotional stress "once in awhile" at the beginning of data collection, and increasingly more so throughout the year. They felt out of control over the direction of their lives "once in awhile" at the beginning, and increasingly more so throughout the year. Mutuality between adult family members was "sometimes" a problem by year end, yet "almost never" an issue at the beginning of the data collection period. Financially, this family "frequently" had the resources to cover necessities. This couple "frequently" had faith in their problem-solving abilities, and this confidence increased over the year. They also "frequently" just accepted stressful events as a fact of life. This typical couple used television as an escape "once in awhile" -- more so toward year end. They "sometimes" relied on God to help them with problems -- but less so toward year end. These parents used alcohol "once in awhile" during difficult times. "Frequently" they would share their troubles with friends and relatives, and "once in awhile" turn to professional resources for help. This couple reported "frequently" feeling pleased at their accomplishments, but slightly less so toward year end. They also were "frequently" excited or interested in daily events, but slightly less so by year end. They reported feeling restless and upset "once in awhile" throughout the year.

The average Treatment Group parents of a child with Developmental Delay, reported feeling physically well most of the time. They agreed their child appreciated and reinforced their parenting efforts.

For the most part there was nothing about their child that bothered them a great deal, and they did not think he / she was especially difficult to care for, when compared to other children. This mother and father very much enjoyed being parents to this child, and believed the child had a special attachment to them. This couple were unsure about how much of their lives they were giving up for this child. They did not feel guilty about their feelings for him / her; and they did not believe the child was causing marital problems -- although they were less sure of this point later in the year. Overall this couple felt they had enough people with whom they could discuss parenting concerns -- especially toward year end.

Profile of the Average Pre-Treatment Family

The typical Pre-Treatment Group family consisted of a white, married couple in the 30-40 year age range, with one male child under the age of 18 months. The average family was Protestant, but did not feel religion was a particularly important part of their family life. Parents in this typical family were university educated, with the father employed full-time and the mother at home caring for the child. Their child who had recently been referred to the Early Intervention Program one months ago, was equally likely to have Down Syndrome as Developmental Delay.

The Family of a Child with Down Syndrome

The average Pre-Treatment Group family of a child with Down Syndrome, had enrolled their baby in the program at the age of 6-7 weeks. They were unsure about the severity of their baby's handicap, but were inclined to think it serious. This family was also involved with two other programs to help their child. These average parents were very pleased with their baby's progress in the Early Intervention Program, and reported almost consistently positive interactions with this child.

The typical Pre-Treatment Group family of a child with Down Syndrome, reported they were under a lot of emotional stress "once in awhile" throughout the year. "Once in awhile" they felt the direction of their lives was beyond their control. Mutuality of roles was "almost never" a problem for this family. They frequently had the financial resources to cover expenses that could not be postponed. This couple reported they "almost always" had faith in their problem-solving abilities, and "almost always" accepted stress as a fact of life. They "almost never" used television or alcohol as an escape from problems. They increased their reliance of God from "once in awhile" to "sometimes" throughout the year. At the beginning of the year, this couple reported "frequently" sharing their troubles with friends and relatives, but this practice decreased slightly by mid-year to a "sometimes" occurrence. This family reported using professional resources for family difficulties "once in awhile". Parents in this average family "frequently" felt pleased about their accomplishments. They reported "frequently" feeling interested or excited by daily events. "Once in awhile" they felt restless, and "almost never" upset by others' criticism.

The average Pre-Treatment Group parent of a child with Down Syndrome reported good physical health for most of the year. They agreed their child appreciated and reinforced their parenting efforts, and there was nothing about the child that particularly bothered them a great deal. These parents did not feel their child was especially difficult to care for, and they enjoyed the parenting role. This mother and father felt their child had developed a special attachment to them. This couple did not feel they were sacrificing a lot to meet their child's needs, but they were less sure of this point toward mid-year. These parents denied feeling guilty about the baby, and did not feel he was causing unexpected marital conflicts. This typical couple felt they had enough people to whom they could talk about parenting concerns.

The Family of a Child with Developmental Delay

The average Pre-Treatment Group family of a child with Developmental Delay, had enrolled their baby in the program at the age of 11 months. They were unsure of the severity of their child's handicap. This family was involved with two programs other than the Early Intervention Program, to assist them with this child. These parents were cautious but pleased about the child's progress in the program, and reported almost consistently happy parent-child interactions.

These typical parents reported their family was "sometimes" under a lot of emotional stress. "Once in awhile" they felt the direction of their lives was beyond their control. Mutuality of family roles was reported to be an issue "once in awhile". This couple "frequently" had the money for necessities that could not be postponed. "Frequently" they had confidence in their family's problem-solving abilities, or they just accepted stressful events as a fact of life. "Once in awhile" this couple used television as an escape from problems, or they relied on God for help. They "almost never" used alcohol as a means of coping with family difficulties. These average parents "sometimes" confided in friends and relatives, and "once in awhile" consulted professionals for help with family troubles. This couple reported "sometimes" feeling pleased about their accomplishments, and "frequently" feeling excited or very interested about something. At the beginning of the year they felt restless "once in awhile", and this feeling had increased slightly by summer. "Once in awhile" they felt upset by someone's criticism.

The average Pre-Treatment Group family of a child with Developmental Delay, agreed they were in good physical health most of the time. They felt their child appreciated and reinforced their parenting efforts, and there was nothing about the child that bothered them excessively. This couple did not feel their child was particularly difficult to care for, when compared with other children. They were very happy in the parenting role, and felt their child had developed some special attachment for them. These parents were unsure if they were giving up more of their own lives for the child, than they had expected. They strongly denied feelings of guilt about the baby, and did not feel he was causing unexpected marital conflicts. Overall, this couple felt they had enough people to whom they could talk about parenting concerns.

Profile of the Average Control Group Family

The typical Control Group family consisted of a white, married couple in the 30-40 year age range, with one male child under 2 1/2 years of age. The average family was Catholic, but did not feel religion was an important part of their family life. Parents in this typical family had some university or college education. Both parents were employed full-time and their child attended daycare. These parents did not think their child had a handicap or serious health problem.

These typical parents reported their family was "sometimes" under a lot of emotional stress. "Once in awhile" they felt the direction of their lives was beyond their control. Mutuality of roles was an issue "once in awhile" for this family. "Frequently" the couple had the financial resources to cover items that could not be postponed. They "frequently" had confidence in their family's problem-solving abilities, and accepted stressful events as a fact of life. "Once in awhile" this couple used television as a means of escape from problems -- the father was more inclined to this habit toward the year end. "Once in awhile" they relied on God to help them with difficulties -- the mother was more inclined to this coping mechanism, than was the father. The couple reported "almost never" using alcohol during difficult times. This family sometimes confided in friends and relatives, although less often toward the year end; the mother was more likely to use these informal supports than was the father. They "almost never" consulted professionals to help them deal with family problems. This couple reported they "once in awhile" felt pleased about their accomplishments, and especially excited about / interested in something. "Once in awhile" they felt very restless or upset with others' criticism -- the mother was slightly more inclined to these feelings than was the father.

These average parents agreed they were in good physical health most of the time -- although less so toward year end. They felt their child appreciated and reinforced their parenting efforts. This couple were undecided if there were a few things about their child that bothered them considerably. They did not think their son was more difficult to care for than other children, and they enjoyed their parenting role. These parents agreed their child was attached to them -- the mother more than the father held this belief. Both parents were unsure if they were giving up more of their lives for this child than previously anticipated. They denied feeling guilty about their child, and disagreed that he was causing marital conflicts. This typical couple felt they had enough people to whom they could talk about parenting concerns.

Presentation and Interpretation of Quantitative Data

Pearson Correlations

Pearson correlations were computed on the 105 study variables using all 156 cases. Pairwise deletion of missing values was used, so the number of cases varies with each calculation. The aim of this section of the analysis was to determine the need for continued analysis (i.e. structural equation modeling) by subgroup.

The Pearson correlation measures the degree and direction of linear relationship between two variables; it cannot be interpreted as proof of a cause-effect relation. In a positive correlation, the two variables move in the same direction, i.e. when one variable increases so too does the other. In a negative correlation, the two variables move in opposite directions, i.e. when one variable increases, the other variable decreases. A perfect correlation of 1.00 means there is a 100% predictable relation between the two variables; a correlation of zero indicates there is no predictable relation between the variables. Correlation coefficients between 0-1.00 cannot however be interpreted as proportions of predictability. For example a correlation of $r=0.5$ provides only 25% predictive accuracy (the r value is squared to arrive at predictive accuracy). For this reason only correlations greater than 0.8 were considered important, and reported in Table 32.

The use of Pearson correlation is only appropriate for measuring the degree of relationship between variables which are linearly related. It assumes the variables are random variables distributed in a bivariate normal distribution. Pearson correlation requires that the variables were measured on an interval or ratio scale, like the Likert scale used in this study.

Analysis of Pearson Correlations

Seventeen correlations of the 105 X 105 correlational matrix, exceeded ± 0.8. None of these "significant" correlations however was theoretically relevant. It was not unexpected to find length of time in the program, or child's age to be correlated across three measures. Most of the other correlations are high because of the low number of cases used in the calculation. It is perhaps surprising that COUNSEL or

"Use of Formal Supports" was the only variable with high correlation across time.

This analysis shows no indication of important correlations with sex of parent, diagnosis, age of child, or study group, e.g. the diagnosis of Down Syndrome is not any more associated with parent depression than is the diagnosis of Developmental Delay. (According to this analysis, Treatment Group parents are no more likely to experience attachment problems, for example, than Control Group parents.) The analysis of means and correlations has therefore failed to show evidence of differential need or program impact. For this reason the structural equation models were not constructed and analyzed by diagnostic or parental subgroup; however model analysis by study subgroup continued.

Table 32

Pearson Correlations (r)

Variable 1	Variable 2	Coefficient (r)	#Cases
EIPMOS1	EIPMOS2	r = 0.986	46
EIPMOS1	EIPMOS3	r = 0.991	14
EIPMOS2	EIPMOS3	r = 0.992	14
EIPMOS3	MARITAL	r = 0.896	14
CHI.AGE1	CHI.AGE2	r = 0.944	105
CHI.AGE1	CHI.AGE3	r = 0.915	55
CHI.AGE2	CHI.AGE3	r = 0.935	55
HAPPYOC3	MASTERY3	r =-0.846	13
HAPPYOC3	COUNSEL2	r =-0.879	13
HAPPYOC3	OTHERPGM	r =-0.803	13
PROGRES3	ISOLATN3	r =-0.816	13
PROGRES3	PHYHLTH1	r =-0.828	12
PROGRES3	COMPET3	r =-0.807	13
COUNSEL3	COUNSEL1	r = 0.893	53
COUNSEL3	COUNSEL2	r = 0.868	52
HANDCAP3	HANDCAP1	r = 0.893	53
FRIENDS3	OTHERPGM	r = 0.907	12

Analyses of the LISREL Structural Equation Models

Readers who are unfamiliar with the technicalities of a LISREL analysis are referred back to the Literature Review on structural equation modeling in Chapter II, for a more indepth explanation and guide to the nomenclature and important sections. The Conceptual Framework in Chapter II articulates the hypotheses depicted in each of the models.

Early Revisions to the Modeling of Time

Early in the LISREL analyses of the six models depicted in Figures 3 to 8, a major conceptual error in the modeling of time was noted. When three indicators are used to measure one concept they must behave identically, or there will be a poor model fit. While it was true, for example that STRESS1, STRESS2, and STRESS3 were all identical measures of the same concept "Level of Family Stress", there was an implicit expectation of increase or decrease in STRESS over time as a result of program intervention. This assumption invalidated the original causal models, and revised ones were used for the LISREL analysis. There were no changes to the conceptual level of the six models i.e. the top half of the figures were left essentially unchanged; the revision was at the measurement level or bottom half of the figures. Specifically, only one measure or indicator for each concept was used, e.g. STRESS instead of STRESS1, STRESS2, and STRESS3.

This apparently simple revision of the models necessitated a complete re-entry of the raw data. The original data file (Appendix XXV) used each parent as the case unit, and their responses to questions at Wave I, Wave II, and Wave III were recorded on one line or record. The revised data file (Appendix XXVI) used each questionnaire as the case unit. It is important to note that none of the parents' responses were altered by this process -- it was only a re-formating of the original raw data (the demographic variables were not re-entered to this second data file, since they were not required for modeling). This changed the data set from longitudinal to cross-sectional, since all data were essentially from one wave of data collection.

The primary independent variable in the models changed from "Presence / Absence of the Early Intervention Program" (EIP), to "Length of Time in the Early Intervention Program" (EIPMOS). Control Group families were recorded as receiving zero months of treatment. This change means that the passage of time has just been modeled differently, rather than completely removed from the models.

Four of the models were initially analyzed using the Treatment and Pre-Treatment Groups only, and again using all three groups. The best cross-sectional program model was then redrawn as a true longitudinal model, and estimation with the Appendix XXV data file was attempted.

Estimation of Measurement Error

For each of the structural equation models, the independent variable (usually "Length of Time in the Early Intervention Program") was assessed as having 1% measurement error. The dependent variables were assessed as having 5% measurement error. These estimates were assigned by this student, after careful consideration of the potential errors in the data collection and data entry processes. It is this acknowledgement and adjustment for measurement error that makes LISREL modeling superior to regression analyses. One of the drawbacks to removing the multiple indicators of the concepts, was that measurement error on the X and Y variables had to be subjectively assigned, rather than estimated by the LISREL program. In all the models the Maximum Likelihood Squared Multiple Correlations (R^2) for the X and Y variables, were consistent with the assigned estimates of error variance.

The Model Command Files

See Appendices XXVII-XLVI for the Model Command Files, corresponding to each of the twenty models discussed in this analysis. For all the models, the minimum pairwise number of cases was used in the analyses. (Pairwise deletion of missing values was used to maximize the number of cases available for the analyses; listwise deletion would have severely limited the available sample size. It should be noted however that the mathematics supporting the construction of a covariance matrix, presume the use of a listwise number of cases. The implications and effects of the pairwise versus listwise decision, on the final results is unknown.)

The A Models

Three versions of Model A (one each using ESCAPTV, RELYGOD, and DRINK as the indicator for the concept

"Avoidance / Passivity with Problems") were analyzed, initially with the program groups only (i.e. Treatment and Pre-Treatment data) and then with the total data file (i.e. Treatment, Pre-Treatment, and Control Groups). Six A Models were thus generated, e.g. Model A1P designates use of the first indicator ESCAPTV, and data from the program families; Model A3T designates use of the third indicator DRINK, and the total data file.

Covariance Matrices

Refer to Tables 33-38 for the Covariance (S) Matrices used with the six A Models. These are the "real world" data against which the models were tested.

Estimates of Effects

Refer to Tables 39-44 for the Unstandardized Estimates of Effects using Maximum Likelihood Estimation. Note that the direction of effects in some of the models, is opposite to that expected.

Standardized Solution

Refer to Figures 9-14 for the Standardized Beta and Gamma Effects. These effects are to be interpreted as: "the amount of standard deviation change in the dependent variable, that is expected to follow from a one standard deviation change in the impacting intervening / independent variable". These estimates are really the same as the Maximum Likelihood Estimates, except they have been standardized (i.e. given a mean of zero, and standard deviation 1.0) for easier interpretation.

Goodness of Model Fit

The Chi-Square and Level of Probability for each model are reported on both the Maximum Likelihood Estimates Table and the Standardized Effects Figures. Note that all the A Models have a non-significant Chi-Square; Probability Levels ranged from 0.155-0.630. This means that all the models were supported by the data collected (i.e. the differences between $\mathbf{S}$ and $\boldsymbol{\Sigma}$ were found to be small). Given the models are true, there is a 16-63% chance of collecting the same data again.

Model Modification Indices

Models A2T and A3T became Models A4T and A5T respectively, after implementation of a LISREL recommended modification to improve the Chi-Square values. Model A2T/A4T freed the coefficient BE(2,1), i.e. estimated an effect from the concept "Avoidance /

Passivity with Problems", on the concept "Use of Informal Supports". Model A3T/A5T freed the coefficient BE(3,2), i.e. estimated an effect from the concept "Depression about Child", on the concept "Use of Informal Supports". Both modifications could be justified theoretically.

Other LISREL suggested modifications (e.g. freeing the PS, TE, and LY relationships) were ignored, because the Chi-Square values for the remainder of the A Models were already non-significant. Incremental application of the modification indices was not expected to improve the magnitude of estimates, or correct the direction of effects.

Total Direct and Indirect Effects

The analyses of all six models showed that "Length of Time in the Early Intervention Program" had an effect (direct or indirect) on parents' "Avoidance / Passivity with Problems", "Use of Informal Supports", "Depression about the Child", and "Social Isolation". Total effects from ksi to eta's were consistently small (i.e. a one unit change in ksi caused 0.001-0.039 units of change in the eta's).

All the models showed a net positive program effect on "Social Isolation" (i.e. as "Length of Time in the Program" increased, so too did parents' feelings of "Social Isolation"). Most of the models showed a net negative program impact on the other dependent variables (meaning, as "Length of Time in the Program" increased, parents' "Depression", "Use of Informal Supports", and "Avoidance of Problems" all decreased).

Analysis of Residual Covariances

The Q-Plots for the A Models were mostly non-linear with points scattered within one standard deviation of mean zero (the revised Models A4T and A5T had lower residuals and more linear plots).

The Standardized Residuals showed the discrepancy between $\mathbf{S}$ and Σ was greatest for the relationships between FRIENDS ("Use of Informal Supports"), and the other eta variables. All other residuals values were close to zero indicating a good model fit.

Standard Error and T-Values

For most of the A Models, the Standard Error was highest on BE(4,3) BE(3,4), and the PHI and PSI coefficients. The error on PSI indicates there are important concepts that have not been considered in this model.

T-Values for each estimated coefficient are presented with the Maximum Likelihood Estimates, in Tables 40-46. Note that many of the program impacts failed to reach a significant level, i.e. $T < \pm 2.0$.

Proportion of Variance Explained by the Models

The Squared Multiple Correlations (R^2) for each eta, are an indication of how much the models account for the variance of these concepts. The Two Stage Least Squares R for eta1 ranged from 0.001-0.018; the R^2 for eta2 ranged from 0-0.104; the R^2 for eta3 ranged from 0.214-0.263; and the R^2 for eta4 ranged from 0.245-0.301. (TSLS R^2 were reported here for the "A" Models only, since the MLE R^2 for some of the eta were negative.) Overall the A Models explain very little about the dependent variables, "Use of Informal Supports", "Avoidance /Passivity with Problems", "Depression about the Child", and "Social Isolation".

Evidence of Estimation Problems

LISREL had difficulties estimating the coefficients for the A Models, particularly BE(4,3) and BE(3,4). Estimation problems were evidenced by: the

Table 33

Covariance Matrix for Model A1P

	ESCAPTV	FRIENDS	DEPRESS	ISOLATN	EIPMOS
ESCAPTV	.87	-.10	.16	-.18	-.37
FRIENDS	-.10	1.22	.02	.17	-.20
DEPRESS	.16	.02	.82	-.21	-.23
ISOLATN	-.18	.17	-.21	.70	.57
EIPMOS	-.37	-.20	-.23	.57	89.48

Table 34

Covariance Matrix for Model A2P

	RELYGOD	FRIENDS	DEPRESS	ISOLATN	EIPMOS
RELYGOD	2.29	.18	.01	.06	.49
FRIENDS	.18	1.22	.02	.17	-.20
DEPRESS	.01	.02	.82	-.21	-.23
ISOLATN	.06	.17	-.21	.70	.57
EIPMOS	.49	-.20	-.23	.57	89.48

Table 35

Covariance Matrix for Model A3P

	DRINK	FRIENDS	DEPRESS	ISOLATN	EIPMOS
DRINK	.51	-.02	.13	-.15	-.88
FRIENDS	-.02	1.22	.02	.17	-.20
DEPRESS	.13	.02	.82	-.21	-.23
ISOLATN	-.15	.17	-.21	.70	.57
EIPMOS	-.88	-.20	-.23	.57	89.48

Table 36

Covariance Matrix for Model A1T

	ESCAPTU	FRIENDS	DEPRESS	ISOLATN	EIPMOS
ESCAPTU	.97	-.08	.11	-.17	-.40
FRIENDS	-.08	1.45	.01	.22	2.47
DEPRESS	.11	.01	.69	-.22	.06
ISOLATN	-.17	.22	-.22	.79	.71
EIPMOS	-.40	2.47	.06	.71	64.64

Table 37

Covariance Matrix for Model A2T / A4T

	RELYGOD	FRIENDS	DEPRESS	ISOLATN	EIPMOS
RELYGOD	1.95	.35	-.01	.10	1.40
FRIENDS	.35	1.45	.01	.22	2.47
DEPRESS	-.01	.01	.69	-.22	.06
ISOLATN	.10	.22	-.22	.79	.71
EIPMOS	1.40	2.47	.06	.71	64.64

Table 38

Covariance Matrix for Model A3T / A5T

	DRINK	FRIENDS	DEPRESS	ISOLATN	EIPMOS
DRINK	.55	-.08	.12	-.20	-.65
FRIENDS	-.08	1.45	.01	.22	2.47
DEPRESS	.12	.01	.69	-.22	.06
ISOLATN	-.20	.22	-.22	.79	.71
EIPMOS	-.65	2.47	.06	.71	64.64

Table 39

Maximum Likelihood Estimates for Model A1P

Coefficient	MLE	T-Value
BE(3,1)	0.38	2.2
BE(3,4)	0.88	1.3
BE(4,2)	0.16	1.9
BE(4,3)	-0.81	-2.4
GA(1,1)	-0.004	-0.5
GA(2,1)	-0.002	-0.2
GA(3,1)	-0.01	-0.6
PH(1,1)	88.59	8.0
PS(1,1)	0.83	7.7
PS(2,2)	1.16	7.7
PS(3,3)	1.54	1.6
PS(4,4)	0.81	2.7

CHI-SQUARE with 3 degrees of freedom is 2.23

PROBABILITY LEVEL is 0.527

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Table 40

Maximum Likelihood Estimates for Model A2P

Coefficient	MLE	T-Value
BE(3,1)	-0.002	-0.04
BE(3,4)	0.22	0.4
BE(4,2)	0.15	2.2
BE(4,3)	-0.43	-1.1
GA(1,1)	0.01	0.4
GA(2,1)	-0.002	-0.2
GA(3,1)	-0.004	-0.4
PH(1,1)	88.59	8.0
PS(1,1)	2.18	7.7
PS(2,2)	1.16	7.7
PS(3,3)	0.90	2.1
PS(4,4)	0.61	4.9

CHI-SQUARE with 3 degrees of freedom is 2.18

PROBABILITY LEVEL is 0.537

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Table 41

Maximum Likelihood Estimates for Model A3P

Coefficient	MLE	T-Value
BE(3,1)	0.58	2.3
BE(3,4)	0.99	1.5
BE(4,2)	0.16	1.9
BE(4,3)	-0.86	-2.6
GA(1,1)	-0.01	-1.5
GA(2,1)	-0.002	-0.2
GA(3,1)	-0.003	-0.2
PH(1,1)	88.59	8.1
PS(1,1)	0.48	7.7
PS(2,2)	1.16	7.7
PS(3,3)	1.67	1.6
PS(4,4)	0.85	2.7

CHI-SQUARE with 3 degrees of freedom is 1.73

PROBABILITY LEVEL is 0.630

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Table 42

Maximum Likelihood Estimates for Model A1T

Coefficient	MLE	T-Value
BE(3,1)	0.23	2.8
BE(3,4)	0.61	1.6
BE(4,2)	0.17	3.4
BE(4,3)	-0.83	-3.2
GA(1,1)	-0.01	-0.9
GA(2,1)	0.04	4.6
GA(3,1)	-0.004	-0.5
PH(1,1)	64.00	12.2
PS(1,1)	0.92	11.7
PS(2,2)	1.28	11.7
PS(3,3)	1.15	2.4
PS(4,4)	0.80	4.4

CHI-SQUARE with 3 degrees of freedom is 5.24

PROBABILITY LEVEL is 0.155

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Table 43

Maximum Likelihood Estimates for Model A2T / A4T

Coefficient	MLE	T-Value
BE(2,1)	0.16	3.2
BE(3,1)	-0.01	-0.3
BE(3,4)	0.05	0.2
BE(4,2)	0.16	3.9
BE(4,3)	-0.38	-1.4
GA(1,1)	0.02	2.2
GA(2,1)	0.04	4.2
GA(3,1)	0.001	0.1
PH(1,1)	64.00	12.2
PS(1,1)	1.82	11.7
PS(2,2)	1.24	11.6
PS(3,3)	0.68	4.4
PS(4,4)	0.64	11.0

CHI-SQUARE with 2 degrees of freedom is 1.09

PROBABILITY LEVEL is 0.580.

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Table 44

Maximum Likelihood Estimates for Model A3T / A5T

Coefficient	MLE	T-Value
BE(3,1)	1.05	1.8
BE(3,2)	-0.31	-1.3
BE(3,4)	2.31	1.5
BE(4,2)	0.17	2.5
BE(4,3)	-1.60	-3.3
GA(1,1)	-0.01	-1.9
GA(2,1)	0.04	4.6
GA(3,1)	-0.002	-0.1
PH(1,1)	64.00	12.2
PS(1,1)	0.52	11.7
PS(2,2)	1.28	11.7
PS(3,3)	4.90	1.0
PS(4,4)	1.69	2.0

CHI-SQUARE with 2 degrees of freedom is 1.44

PROBABILITY LEVEL is 0.486

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Figure 9. Standardized Effects for Model A1P

$$\chi^2_{3df} = 2.23 \text{ (PROB. = 0.527)}$$

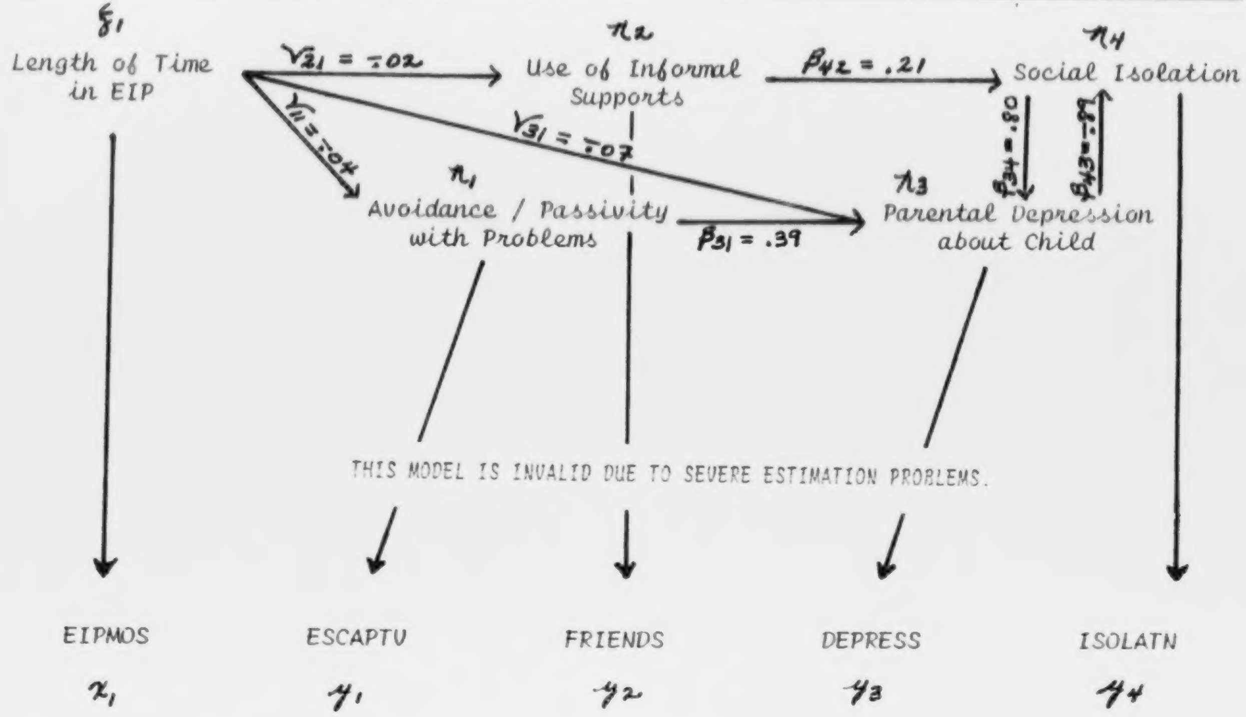

ξ_1
Length of Time in EIP
$\gamma_{21} = -.02$
$\gamma_{11} = -.04$
$\gamma_{31} = -.07$
η_2
Use of Informal Supports
$\beta_{42} = .21$
η_4
Social Isolation
$\beta_{34} = .80$
$\beta_{43} = -.89$
η_1
Avoidance / Passivity with Problems
$\beta_{31} = .39$
η_3
Parental Depression about Child
THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.
EIPMOS
x_1
ESCAPTU
y_1
FRIENDS
y_2
DEPRESS
y_3
ISOLATN
y_4

Figure 10. Standardized Effects for Model A2P

$\chi^2_{3df} = 2.18$ (PROB. = 0.537)

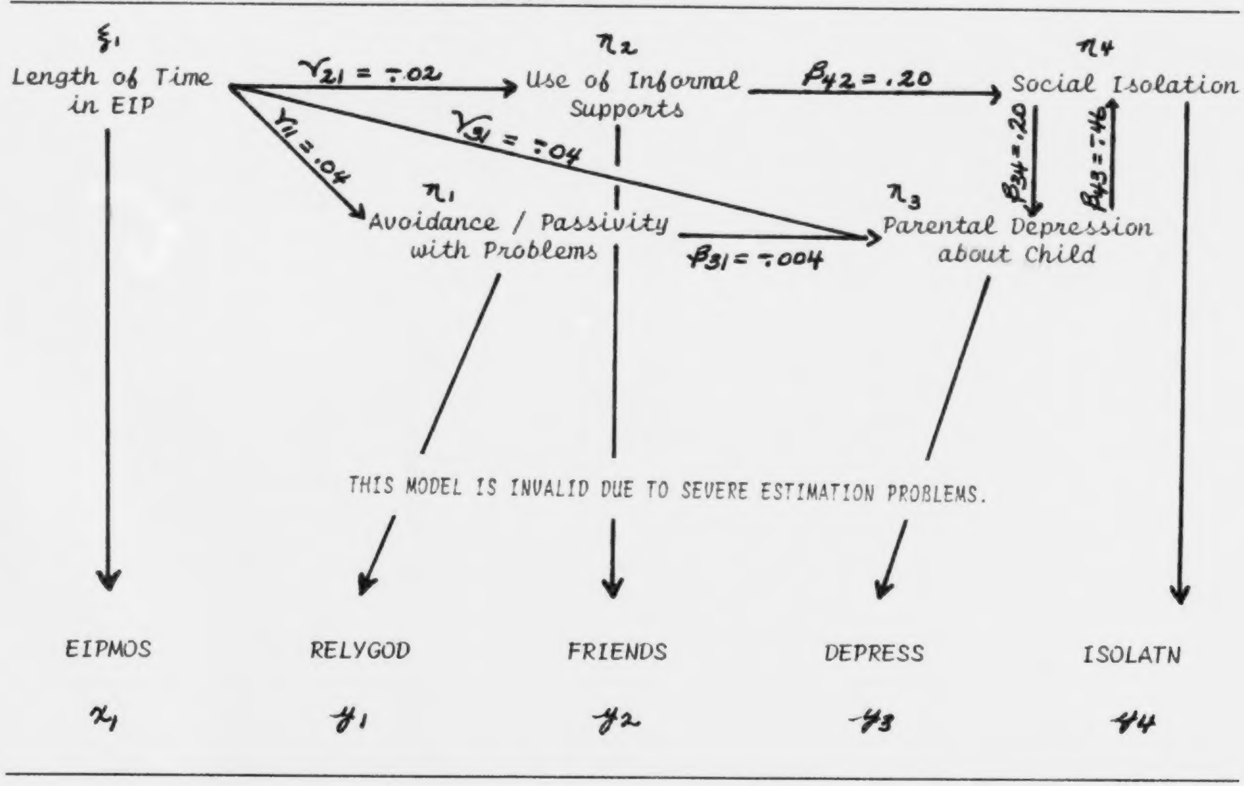
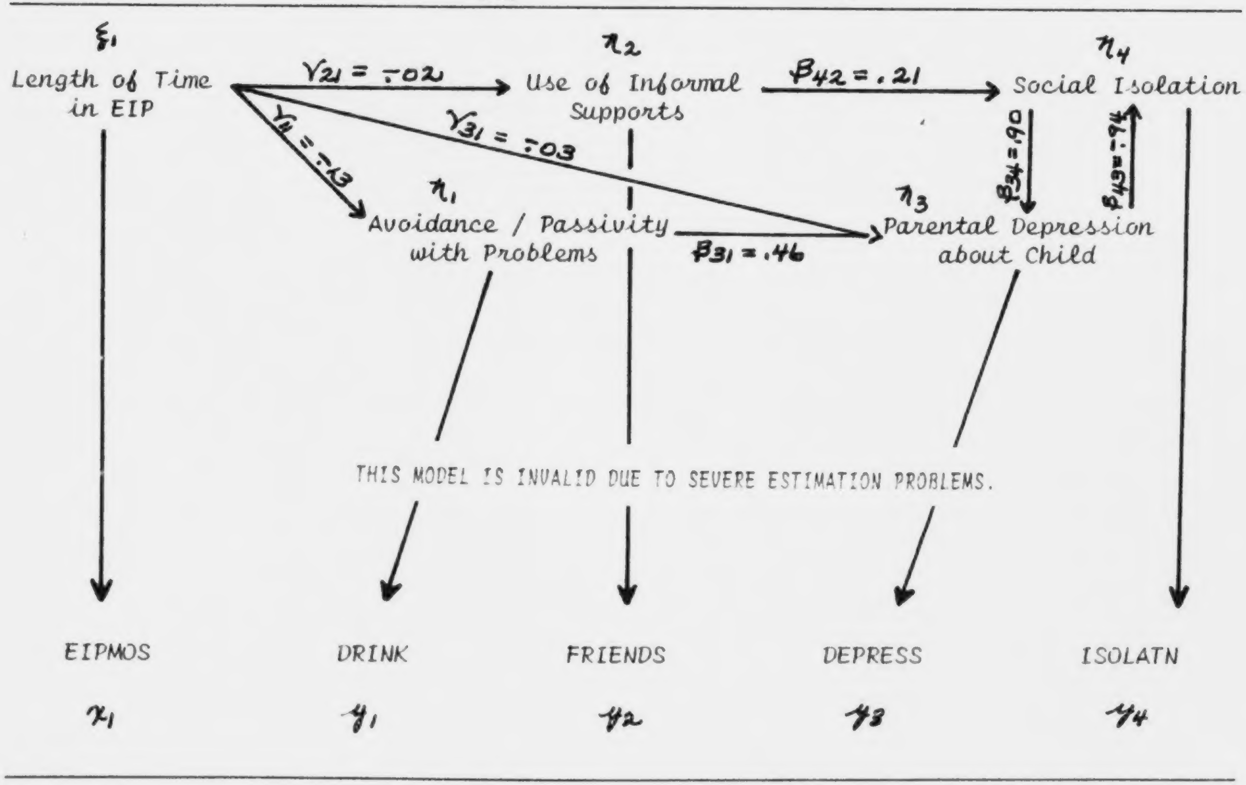

ξ_1
Length of Time in EIP
$\gamma_{21} = -.02$
$\gamma_{11} = .04$
$\gamma_{31} = -.04$
η_2
Use of Informal Supports
$\beta_{42} = .20$
η_4
Social Isolation
$\beta_{34} = .20$
$\beta_{43} = -.46$
η_1
Avoidance / Passivity with Problems
$\beta_{31} = -.004$
η_3
Parental Depression about Child
THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.
EIPMOS
RELYGOD
FRIENDS
DEPRESS
ISOLATN
x_1
y_1
y_2
y_3
y_4

Figure 11. Standardized Effects for Model A3P

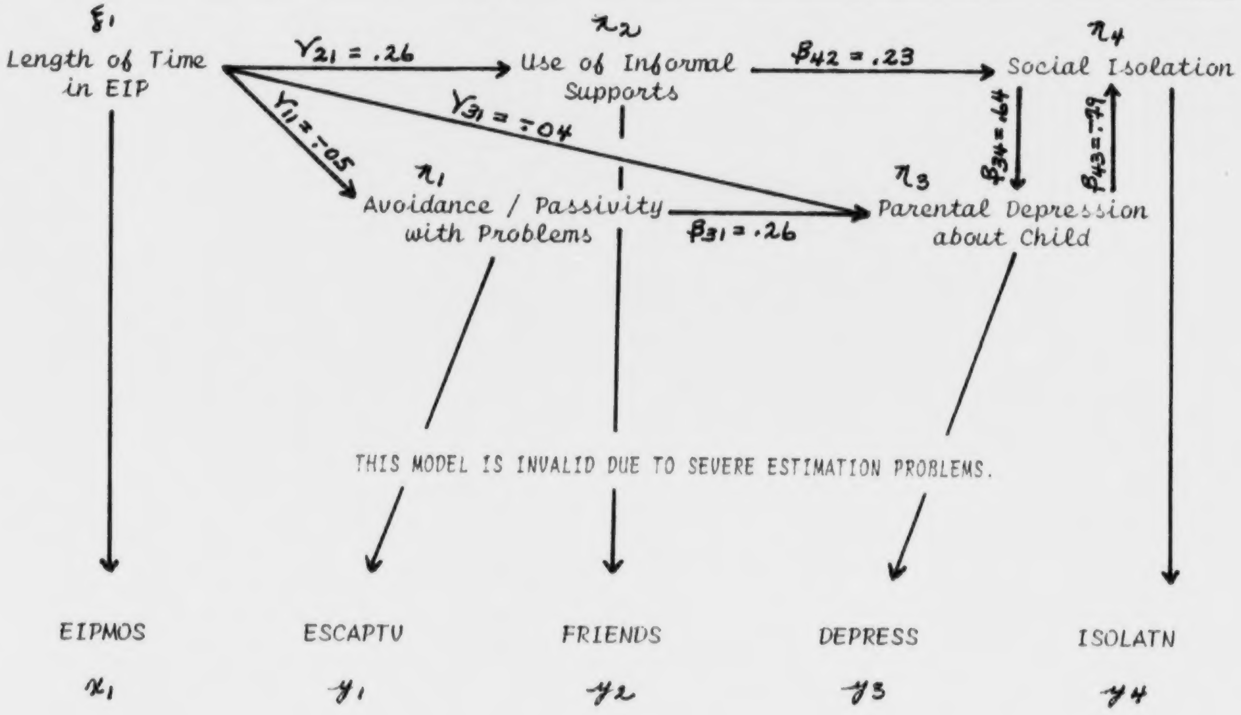
$\chi^2_{3df} = 1.73$ (PROB. = 0.630)


ξ_1
Length of Time in EIP
$\gamma_{21} = -.02$
η_2
Use of Informal Supports
$\beta_{42} = .21$
η_4
Social Isolation
$\gamma_{11} = -.13$
$\gamma_{31} = -.03$
η_1
Avoidance / Passivity with Problems
$\beta_{31} = .46$
η_3
Parental Depression about Child
$\beta_{34} = .90$
$\beta_{43} = -.94$
EIPMOS
DRINK
FRIENDS
DEPRESS
ISOLATN
x_1
y_1
y_2
y_3
y_4

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Figure 12. Standardized Effects for Model A1T

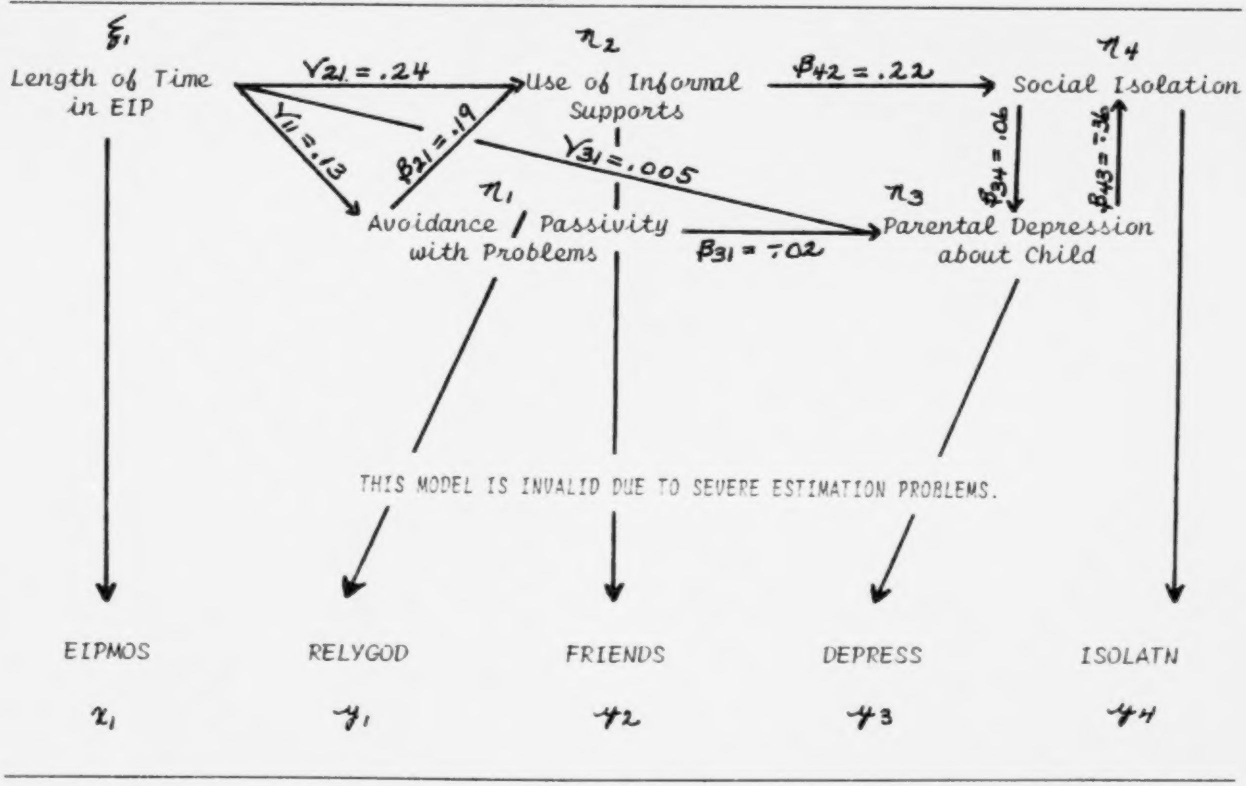
$\chi^2_{3df} = 5.24$ (PROB. = 0.155)


ξ_1
Length of Time in EIP
$\gamma_{21} = .26$
η_2
Use of Informal Supports
$\beta_{42} = .23$
η_4
Social Isolation
$\gamma_{11} = -.05$
$\gamma_{31} = -.04$
$\beta_{34} = .64$
$\beta_{43} = -.79$
η_1
Avoidance / Passivity with Problems
$\beta_{31} = .26$
η_3
Parental Depression about Child
EIPMOS
ESCAPTU
FRIENDS
DEPRESS
ISOLATN
x_1
y_1
y_2
y_3
y_4

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Figure 13. Standardized Effects for Model A2T / A4T

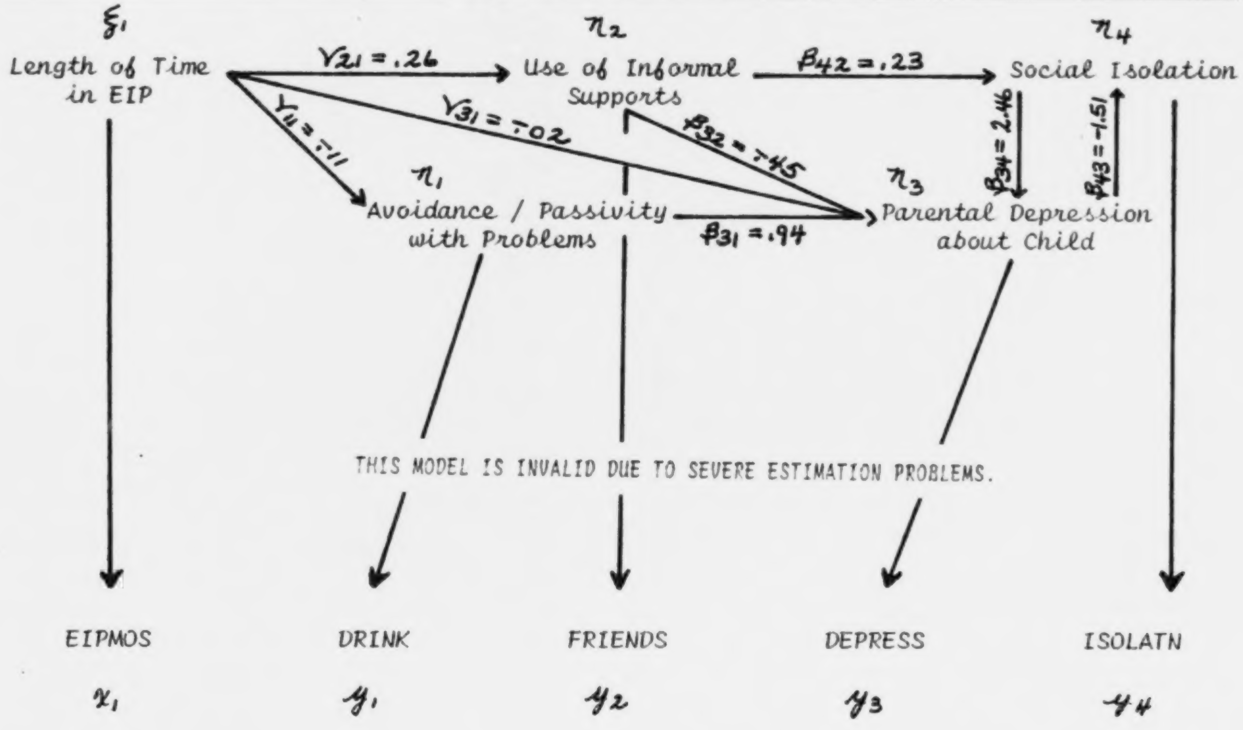
$$\chi^2_{2df} = 1.09 \ (PROB = 0.580)$$


ξ_1
Length of Time in EIP
$\gamma_{21} = .24$
$\gamma_{11} = .13$
$\beta_{21} = .19$
η_2
Use of Informal Supports
$\gamma_{31} = .005$
$\beta_{42} = .22$
η_4
Social Isolation
$\beta_{34} = .06$
$\beta_{43} = -.36$
η_1
Avoidance / Passivity with Problems
$\beta_{31} = -.02$
η_3
Parental Depression about Child
EIPMOS
RELYGOD
FRIENDS
DEPRESS
ISOLATN
x_1
y_1
y_2
y_3
y_4

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Figure 14. Standardized Effects for Model A3T / A5T

$\chi^2_{2df} = 1.44$ (PROB. = 0.486)


ξ_1
Length of Time in EIP
η_2
Use of Informal Supports
η_4
Social Isolation
$\gamma_{21} = .26$
$\beta_{42} = .23$
$\gamma_{11} = -.11$
$\gamma_{31} = -.02$
$\beta_{32} = -.45$
$\beta_{34} = 2.46$
$\beta_{43} = -1.51$
η_1
Avoidance / Passivity with Problems
$\beta_{31} = .94$
η_3
Parental Depression about Child
THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.
EIPMOS
DRINK
FRIENDS
DEPRESS
ISOLATN
x_1
y_1
y_2
y_3
y_4

large Standard Error values for these coefficients; multiple high Correlations of Estimates; PSI diagonals greater than 1.0 in the Standardized Solution; large differences between the Initial Estimates and the final Maximum Likelihood Estimates; and the number of iterations required to arrive at the estimates, i.e. 15-30. The data matrix and model specifications were double checked to ensure these problems were not due to entry errors.

Since the Standardized Solution showed low correlations among the eta, the estimation difficulties were likely not due to colinearity but rather to underidentification (i.e. specifying reciprocal effects between "Depression about Child" and "Social Isolation" made the model unclear).

The B Models

This model was run initially with program data only (i.e. data from the Treatment and Pre-Treatment Groups), and again with the total data file (i.e. using the Treatment, Pre-Treatment, and Control Groups). Two B Models were therefore generated, i.e. Models B1P and B1T.

Covariance Matrices

Refer to Tables 45-46 for the Covariance (**S**) Matrices used with the B Models.

Estimates of Effects

Refer to Tables 47-48 for the Unstandardized Estimates of Effects using Maximum Likelihood Estimation. Note that the direction of some effects is opposite to that expected.

Standardized Solution

Refer to Figures 15-16 for the Standardized Beta and Gamma Effects.

Goodness of Model Fit

The Chi-Square and Level of Probability for each Model B are reported with the Maximum Likelihood Estimates and the Standardized Effects. Note that both models have a non-significant Chi-Square, with Probability Levels ranging from 0.44-0.59.

Model Modification Indices

Since the Chi-Square values were non-signficant on the first trial, LISREL'S suggestions for model modification were not implemented.

Total Direct and Indirect Effects

The analyses of both models showed that "Length of Time in the Early Intervention Program" had a net negative effect on "Restrictiveness of Parenting Role" and "Conflict with Partner". The two models differed in the presence and direction of effects the program had on "Financial Security" and "Use of Formal Supports". Total effects from the program (whether by direct or indirect pathways) were consistently small in magnitude, i.e. nil-0.026.

Analysis of Residual Covariances

The Q-Plots for the B Models were nearly linear at 90°, with a few outliers at one standard deviation from the mean.

The Standardized Residuals showed the greatest discrepancies between the model and the data, occured in the relationships between CONFLCT ("Conflict with Partner) and EIPMOS ("Length of Time in the Early Intervention Program"); and CONFLCT and COUNSEL ("Use of Formal Supports"). All other residual values were close to zero, indicating a good model fit.

Standard Error and T-Values

There were no large Standard Errors except for PH(1,1). T-Values for the estimated parameters are reported with the Maximum Likelihood Estimates. Note that most program effects failed to reach significance.

Proportion of Variance Explained by the Models

The Maximum Likelihood Squared Multiple Correlations (R^2) for eta1 ranged from 0-0.055; R^2 for eta2 ranged from 0.002-0.008; R^2 for eta3 ranged from 0.041-0.084; and R^2 for eta4 ranged from 0.224-0.339. Overall the B Models explained very little about the variability of the concepts.

Evidence of Estimation Problems

There was no indication LISREL was having difficulties estimating the parameters in these two models. Initial Estimates were generally close to the final Maximum Likelihood Estimates; 4-17 iterations were required (the B1T Model required more estimation attempts). All matrices contained reasonable values with respect to magnitude, and there was no evidence of high correlation among the eta or parameter estimates.

Table 45

Covariance Matrix for Model B1P

	COUNSEL	FINSEC	RESTRIC	CONFLCT	EIPMOS
COUNSEL	1.12	.11	.33	.26	-2.27
FINSEC	.11	1.42	-.01	.01	-.67
RESTRIC	.33	-.01	1.59	.75	-1.94
CONFLCT	.26	.01	.75	1.17	-.72
EIPMOS	-2.27	-.67	-1.94	-.72	89.48

Table 46

Covariance Matrix for Model B1T

	COUNSEL	FINSEC	RESTRIC	CONFLCT	EIPMOS
COUNSEL	.83	.06	.18	.10	.06
FINSEC	.06	1.72	.05	.04	.60
RESTRIC	.18	.05	1.52	.65	-.93
CONFLCT	.10	.04	.65	1.37	-1.02
EIPMOS	.06	.60	-.93	-1.02	64.64

Table 47

Maximum Likelihood Estimates for Model B1P

Coefficient	MLE	T-Value
BE(2,1)	0.10	1.0
BE(3,1)	0.29	2.7
BE(3,2)	-0.04	-0.4
BE(4,2)	0.01	0.2
BE(4,3)	0.50	7.6
GA(1,1)	-0.03	-2.7
GA(3,1)	-0.02	-1.3
PH(1,1)	88.59	8.0
PS(1,1)	1.01	7.6
PS(2,2)	1.34	7.7
PS(3,3)	1.38	7.6
PS(4,4)	0.73	7.3

CHI-SQUARE with 3 degrees of freedom is 1.91

PROBABILITY LEVEL is 0.591

Table 48

Maximum Likelihood Estimates for Model B1T

Coefficient	MLE	T-Value
BE(2,1)	0.07	0.8
BE(3,1)	0.23	2.9
BE(3,2)	0.03	0.5
BE(4,2)	0.01	0.2
BE(4,3)	0.45	8.7
GA(1,1)	0.001	0.2
GA(3,1)	-0.02	-1.8
PH(1,1)	64.00	12.2
PS(1,1)	0.79	11.7
PS(2,2)	1.63	11.7
PS(3,3)	1.38	11.6
PS(4,4)	1.01	11.4

CHI-SQUARE with 3 degrees of freedom is 2.73

PROBABILITY LEVEL is 0.436

Figure 15. Standardized Effects for Model B1P

$\chi^2_{3df} = 1.91$ (PROB. = 0.591)

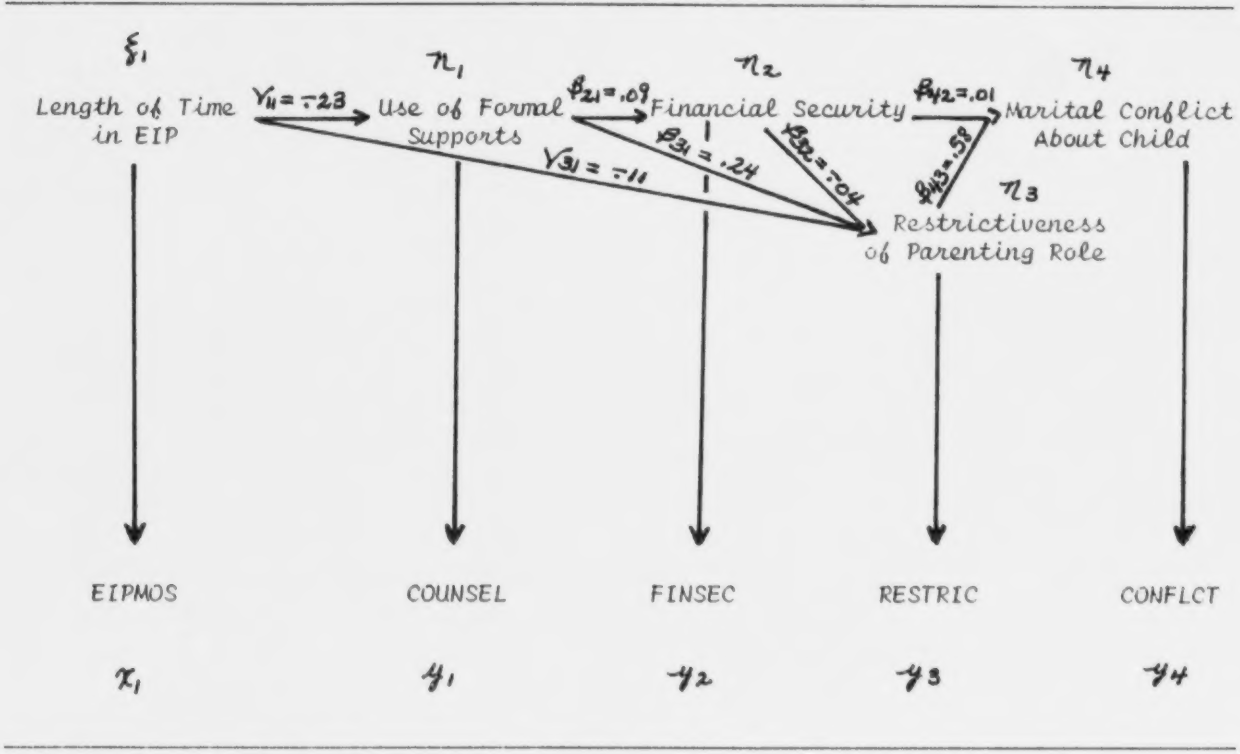
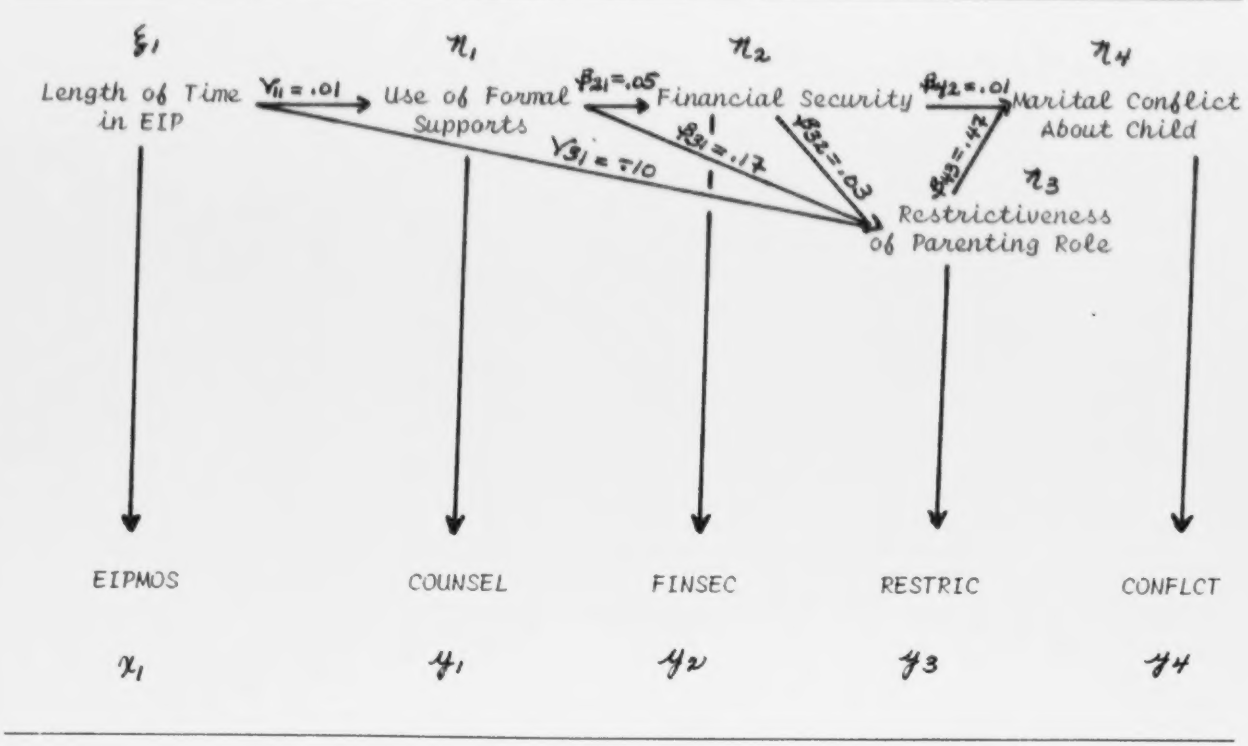

ξ_1
Length of Time in EIP
$\gamma_{11} = -.23$
η_1
Use of Formal Supports
$\beta_{21} = .09$
η_2
Financial Security
$\beta_{42} = .01$
η_4
Marital Conflict About Child
$\gamma_{31} = -.11$
$\beta_{31} = .24$
$\beta_{32} = -.04$
$\beta_{43} = .58$
η_3
Restrictiveness of Parenting Role
EIPMOS
COUNSEL
FINSEC
RESTRIC
CONFLCT
x_1
y_1
y_2
y_3
y_4

Figure 16. Standardized Effects for Model B1T

$\chi^2_{3df} = 2.73$ (PROB. = 0.436)


ξ_1
Length of Time in EIP
$\gamma_{11} = .01$
η_1
Use of Formal Supports
$\beta_{21} = .05$
η_2
Financial Security
$\beta_{42} = .01$
η_4
Marital Conflict About Child
$\gamma_{31} = -.10$
$\beta_{31} = .17$
$\beta_{32} = .03$
$\beta_{43} = .42$
η_3
Restrictiveness of Parenting Role
EIPMOS
COUNSEL
FINSEC
RESTRIC
CONFLCT
x_1
y_1
y_2
y_3
y_4

The C Models

Four versions of Model C were analyzed each with the program data and the total data; this resulted in eight slightly different C Models.

Covariance Matrices

Refer to Tables 49-56 for the Covariance (**S**) Matrices used with the eight C Models.

Estimates of Effects

Refer to Tables 57-64 for the Unstandardized Estimates of Effects using Maximum Likelihood Estimation. Note that the direction of effects in some of the models is opposite to that expected.

Standardized Solution

Refer to Figures 17-24 for the Standardized Beta and Gamma Effects.

Goodness of Model Fit

The Chi-Square and Level of Probability for each Model C are reported with the Maximum Likelihood Estimates and the Standardized Effects. Note that all the models have a non-significant Chi-Square, with Probability Levels ranging from 0.15-0.50.

Model Modification Indices

Models C1P, C3T, and C2T became Models C5P, C6T, and C7T respectively, after implementation of a LISREL recommended modification to improve the Chi-Square values. Models C6T and C7T freed the coefficient BE(2,3), i.e. modeled a reciprocal effect from "Physical Health" on "Negative Psychological Well-Being". Model C5P estimated an additional program effect GA(3,1). These modifications could be supported theoretically.

All other LISREL suggested modifications were ignored, since the Chi-Square values were non-significant on the other models' first trials.

Total Direct and Indirect Effects

All eight analyses of the models showed "Length of Time in the Early Intervention Program" had net positive effects on parents' "Positive Psychological Well-Being" and "Physical Health". Six of the models estimated net negative program effects on "Negative Psychological Well-Being". One of the models found zero program impact on parents' perceived "Demandingness of Child", while the other seven models found this effect to be positive. The magnitude of total program effects ranged from 0.001-0.022.

Analysis of Residual Covariances

The Q-Plots of Residual Covariances were nearly 90° linear with the occassional outlier just beyond the first standard deviation.

The largest and most consistent residuals were with the relationship between EIPMOS and PHYHLTH. Other model relationships that did not always fit the data well, were: EIPMOS and DEMAND; UPSET and ACCOMP; RESTLES and ACCOMP; UPSET and INTERST; RESTLES and INTERST; and EIPMOS and UPSET.

Standard Error and T-Values

In general the Standard Errors for the C Models were low, except for PH(1,1) and the PSI diagonals.

T-Values are reported with the Maxmimum Likelihood Estimates. Note that many of the program impacts failed to reach significance.

Proportion of Variance Explained by the Models

The Maximum Likelihood Squared Multiple Correlations (R^2) for eta1 ranged from 0.005-0.031; the R^2 for eta2 ranged from nil-0.003; the R^2 for eta3 ranged from 0.033-0.068; and the R^2 for eta4 ranged

Table 49

Covariance Matrix for Model C2P

	ACCOMP	UPSET	PHYHLTH	DEMAND	EIPMOS
ACCOMP	.83	-.04	.12	-.12	.80
UPSET	-.04	.83	-.08	.23	-.45
PHYHLTH	.12	-.08	.83	-.25	1.51
DEMAND	-.12	.23	-.25	1.35	.02
EIPMOS	.80	-.45	1.51	.02	89.48

Table 50

Covariance Matrix for Model C3P

	INTERST	UPSET	PHYHLTH	DEMAND	EIPMOS
INTERST	.68	-.03	.14	-.13	.54
UPSET	-.03	.83	-.08	.23	-.45
PHYHLTH	.14	-.08	.83	-.25	1.51
DEMAND	-.13	.23	-.25	1.35	.02
EIPMOS	.54	-.45	1.51	.02	89.48

Table 51

Covariance Matrix for Model C4P

	INTERST	RESTLES	PHYHLTH	DEMAND	EIPMOS
INTERST	.68	.06	.14	-.13	.54
RESTLES	.06	1.52	-.10	.02	-.10
PHYHLTH	.14	-.10	.83	-.25	1.51
DEMAND	-.13	.02	-.25	1.35	.02
EIPMOS	.54	-.10	1.51	.02	89.48

Table 52

Covariance Matrix for Model C1P / C5P

	ACCOMP	RESTLES	PHYHLTH	DEMAND	EIPMOS
ACCOMP	.83	.12	.12	-.12	.80
RESTLES	.12	1.52	-.10	.02	-.10
PHYHLTH	.12	-.10	.83	-.25	1.51
DEMAND	-.12	.02	-.25	1.35	.02
EIPMOS	.80	-.10	1.51	.02	89.48

Table 53

Covariance Matrix for Model C1T

	ACCOMP	RESTLES	PHYHLTH	DEMAND	EIPMOS
ACCOMP	1.04	-.05	.22	-.10	1.39
RESTLES	-.05	1.39	-.02	.11	-.46
PHYHLTH	.22	-.02	.96	-.19	1.00
DEMAND	-.10	.11	-.19	1.08	.91
EIPMOS	1.39	-.46	1.00	.91	64.64

Table 54

Covariance Matrix for Model C4T

	INTERST	RESTLES	PHYHLTH	DEMAND	EIPMOS
INTERST	.91	.00	.20	-.09	.88
RESTLES	.00	1.39	-.02	.11	-.46
PHYHLTH	.20	-.02	.96	-.19	1.00
DEMAND	-.09	.11	-.19	1.08	.91
EIPMOS	.88	-.46	1.00	.91	64.64

Table 55

Covariance Matrix for Model C3T / C6T

	INTERST	UPSET	PHYHLTH	DEMAND	EIPMOS
INTERST	.91	-.16	.20	-.09	.88
UPSET	-.16	.85	-.15	.11	.22
PHYHLTH	.20	-.15	.96	-.19	1.00
DEMAND	-.09	.11	-.19	1.08	.91
EIPMOS	.88	.22	1.00	.91	64.64

Table 56

Covariance Matrix for Model C2T / C7T

	ACCOMP	UPSET	PHYHLTH	DEMAND	EIPMOS
ACCOMP	1.04	-.13	.22	-.10	1.39
UPSET	-.13	.85	-.15	.11	.22
PHYHLTH	.22	-.15	.96	-.19	1.00
DEMAND	-.10	.11	-.19	1.08	.91
EIPMOS	1.39	.22	1.00	.91	64.64

Table 57

Maximum Likelihood Estimates for Model C2P

Coefficient	MLE	T-Value
BE(3,1)	0.16	1.7
BE(3,2)	-0.09	-1.0
BE(4,1)	-0.10	-0.9
BE(4,2)	0.26	2.3
BE(4,3)	-0.29	-2.5
GA(1,1)	0.01	1.1
GA(2,1)	-0.01	-0.6
GA(4,1)	0.01	0.7
PH(1,1)	88.59	7.9
PS(1,1)	0.78	7.5
PS(2,2)	0.78	7.5
PS(3,3)	0.76	7.5
PS(4,4)	1.14	7.5

CHI-SQUARE with 2 degrees of freedom is 3.47

PROBABILITY LEVEL is 0.176

Table 58

Maximum Likelihood Estimates for Model C3P

Coefficient	MLE	T-Value
BE(3,1)	0.22	2.2
BE(3,2)	-0.09	-1.0
BE(4,1)	-0.13	-1.0
BE(4,2)	0.26	2.3
BE(4,3)	-0.28	-2.4
GA(1,1)	0.01	0.8
GA(2,1)	-0.01	-0.6
GA(4,1)	0.01	0.7
PH(1,1)	88.59	7.9
PS(1,1)	0.64	7.5
PS(2,2)	0.78	7.5
PS(3,3)	0.75	7.5
PS(4,4)	1.13	7.4

CHI-SQUARE with 2 degrees of freedom is 3.45

PROBABILITY LEVEL is 0.178

Table 59

Maximum Likelihood Estimates for Model C4P

Coefficient	MLE	T-Value
BE(3,1)	0.23	2.3
BE(3,2)	-0.08	-1.2
BE(4,1)	-0.14	-1.0
BE(4,2)	0.001	0.01
BE(4,3)	-0.30	-2.5
GA(1,1)	0.01	0.8
GA(2,1)	-0.001	-0.1
GA(4,1)	0.01	0.6
PH(1,1)	88.59	7.9
PS(1,1)	0.64	7.5
PS(2,2)	1.44	7.5
PS(3,3)	0.74	7.5
PS(4,4)	1.19	7.5

CHI-SQUARE with 2 degrees of freedom is 3.87

PROBABILITY LEVEL is 0.145

Table 60

Maximum Likelihood Estimates for Model C1P / C5P

Coefficient	MLE	T-Value
BE(3,1)	0.16	1.7
BE(3,2)	-0.08	-1.2
BE(4,1)	-0.11	-0.9
BE(4,2)	0.004	0.04
BE(4,3)	-0.31	-2.6
GA(1,1)	0.01	1.04
GA(2,1)	-0.001	-0.1
GA(3,1)	0.02	1.8
GA(4,1)	0.01	0.6
PH(1,1)	88.59	7.9
PS(1,1)	0.78	7.5
PS(2,2)	1.44	7.5
PS(3,3)	0.73	7.5
PS(4,4)	1.19	7.5

CHI-SQUARE with 1 degree of freedom is 1.43

PROBABILITY LEVEL is 0.232

Table 61

Maximum Likelihood Estimates for Model C1T

Coefficients	MLE	T-Value
BE(3,1)	0.22	3.9
BE(3,2)	-0.003	-0.1
BE(4,1)	-0.07	-1.2
BE(4,2)	0.08	1.6
BE(4,3)	-0.21	-3.3
GA(1,1)	0.02	3.0
GA(2,1)	-0.01	-0.8
GA(4,1)	0.02	2.6
PH(1,1)	64.00	12.0
PS(1,1)	0.96	11.5
PS(2,2)	1.32	11.5
PS(3,3)	0.86	11.4
PS(4,4)	0.95	11.4

CHI-SQUARE with 2 degrees of freedom is 2.89

PROBABILITY LEVEL is 0.236

Table 62

Maximum Likelihood Estimates for Model C4T

Coefficient	MLE	T-Value
BE(3,1)	0.24	3.8
BE(3,2)	-0.01	-0.2
BE(4,1)	-0.07	-1.0
BE(4,2)	0.09	1.6
BE(4,3)	-0.22	-3.3
GA(1,1)	0.01	1.98
GA(2,1)	-0.01	-0.8
GA(4,1)	0.02	2.5
PH(1,1)	64.00	12.0
PS(1,1)	0.85	11.5
PS(2,2)	1.32	11.5
PS(3,3)	0.86	11.4
PS(4,4)	0.95	11.4

CHI-SQUARE with 2 degrees of freedom is 3.17

PROBABILITY LEVEL is 0.205

Table 63

Maximum Likelihood Estimates for Model C3T / C6T

Coefficient	MLE	T-Value
BE(2,3)	-0.94	-2.9
BE(3,1)	0.43	3.2
BE(3,2)	1.04	2.1
BE(4,1)	-0.05	-0.8
BE(4,2)	0.09	1.2
BE(4,3)	-0.20	-3.1
GA(1,1)	0.01	1.98
GA(2,1)	0.02	1.9
GA(4,1)	0.02	2.4
PH(1,1)	64.00	12.0
PS(1,1)	0.85	11.5
PS(2,2)	1.30	2.8
PS(3,3)	1.93	2.1
PS(4,4)	0.95	11.4

CHI-SQUARE with 1 degree of freedom is 0.45

PROBABILITY LEVEL is 0.500

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Table 64

Maximum Likelihood Estimates for Model C2T / C7T

Coefficient	MLE	T-Value
BE(2,3)	-0.79	-2.6
BE(3,1)	0.34	3.3
BE(3,2)	0.82	1.9
BE(4,1)	-0.07	-1.1
BE(4,2)	0.09	1.2
BE(4,3)	-0.20	-3.0
GA(1,1)	0.02	2.9
GA(2,1)	0.02	1.8
GA(4,1)	0.02	2.4
PH(1,1)	64.00	12.0
PS(1,1)	0.96	11.5
PS(2,2)	1.12	3.2
PS(3,3)	1.58	2.3
PS(4,4)	0.95	11.4

CHI-SQUARE with 1 degree of freedom is 0.46

PROBABILITY LEVEL is 0.500

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Figure 17. Standardized Effects for Model C2P

$\chi^2_{2df} = 3.47$ (PROB. = 0.176)

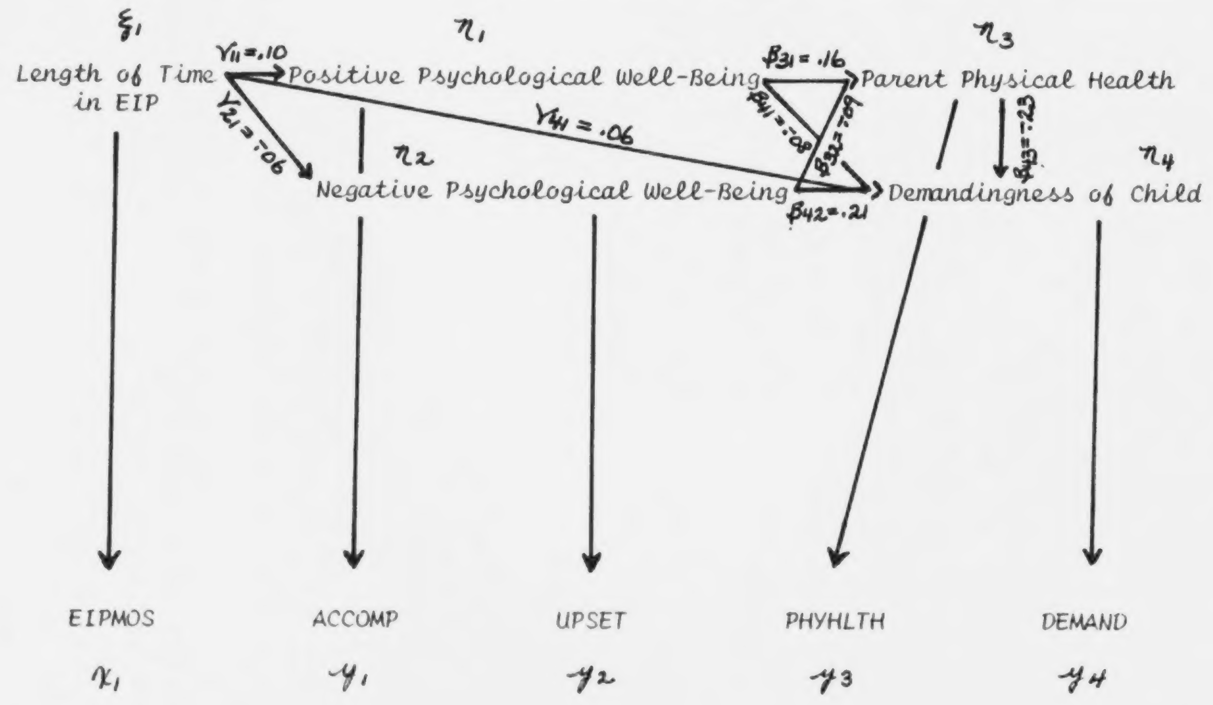

ξ_1
Length of Time in EIP
$\gamma_{11} = .10$
$\gamma_{21} = -.06$
η_1
Positive Psychological Well-Being
η_2
Negative Psychological Well-Being
$\gamma_{41} = .06$
$\beta_{31} = .16$
$\beta_{41} = -.08$
$\beta_{32} = -.09$
$\beta_{42} = .21$
η_3
Parent Physical Health
$\beta_{43} = -.23$
η_4
Demandingness of Child
EIPMOS
x_1
ACCOMP
y_1
UPSET
y_2
PHYHLTH
y_3
DEMAND
y_4

Figure 18. Standardized Effects for Model C3P

$\chi^2_{2df} = 3.45$ (PROB. = 0.178)

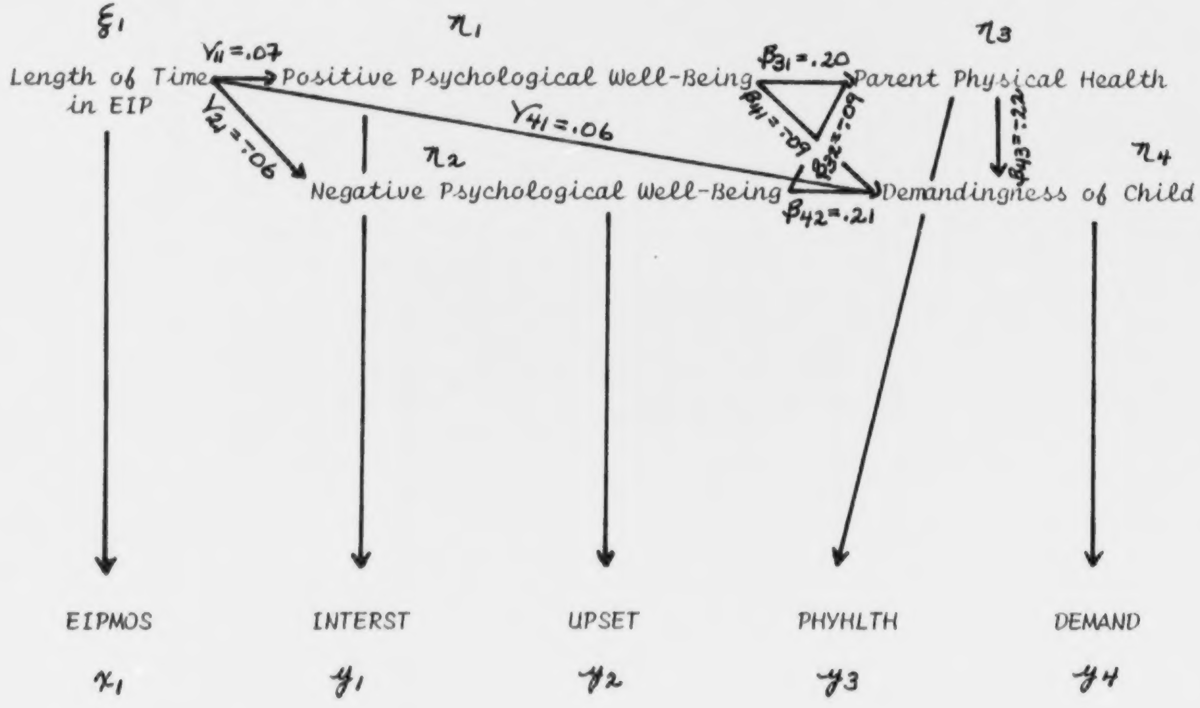

ξ_1
Length of Time in EIP
$\gamma_{11} = .07$
$\gamma_{21} = -.06$
η_1
Positive Psychological Well-Being
$\gamma_{41} = .06$
η_2
Negative Psychological Well-Being
$\beta_{31} = .20$
$\beta_{41} = -.09$
$\beta_{32} = -.09$
$\beta_{42} = .21$
η_3
Parent Physical Health
$\beta_{43} = -.22$
η_4
Demandingness of Child
EIPMOS
x_1
INTERST
y_1
UPSET
y_2
PHYHLTH
y_3
DEMAND
y_4

Figure 19. Standardized Effects for Model C4P

$$\chi^2_{2df} = 3.87 \text{ (PROB. = 0.145)}$$

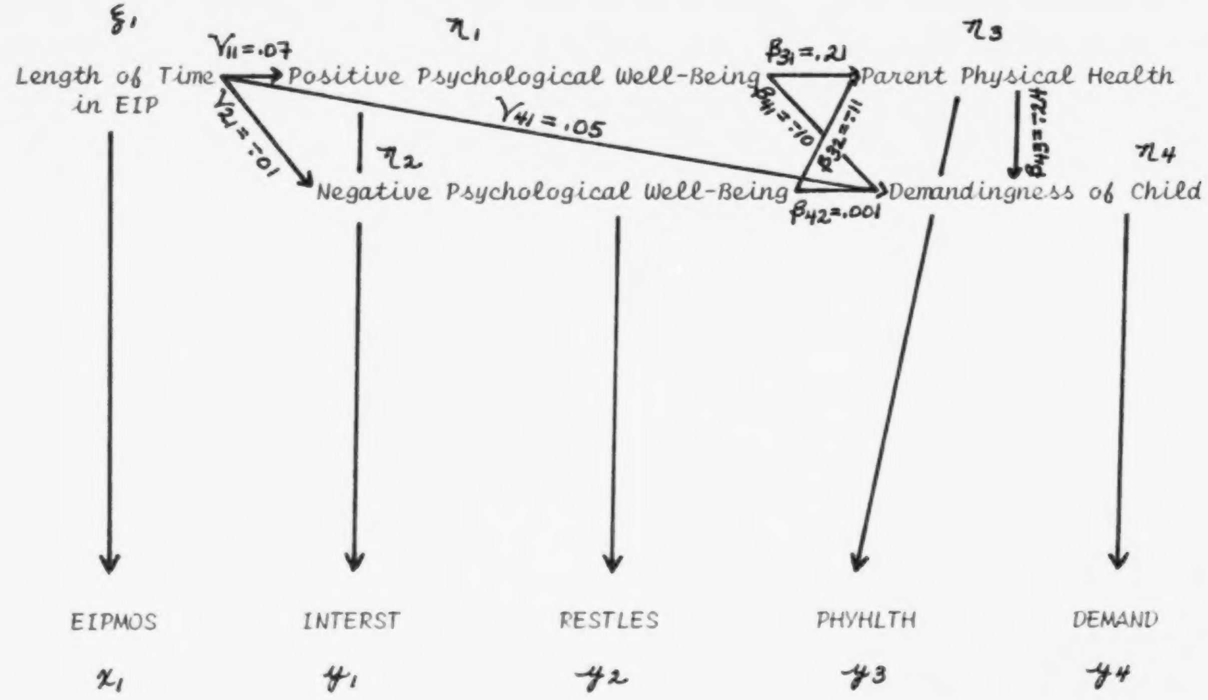

ξ_1
Length of Time in EIP
$\gamma_{11} = .07$
$\gamma_{21} = -.01$
η_1
Positive Psychological Well-Being
η_2
Negative Psychological Well-Being
$\gamma_{41} = .05$
$\beta_{31} = .21$
$\beta_{41} = -.10$
$\beta_{32} = -.11$
$\beta_{42} = .001$
η_3
Parent Physical Health
$\beta_{43} = -.24$
η_4
Demandingness of Child
EIPMOS
x_1
INTERST
y_1
RESTLES
y_2
PHYHLTH
y_3
DEMAND
y_4

Figure 20. Standardized Effects for Model C1P / C5P

$\chi^2_{1\,df} = 1.43$ (PROB. = 0.232)

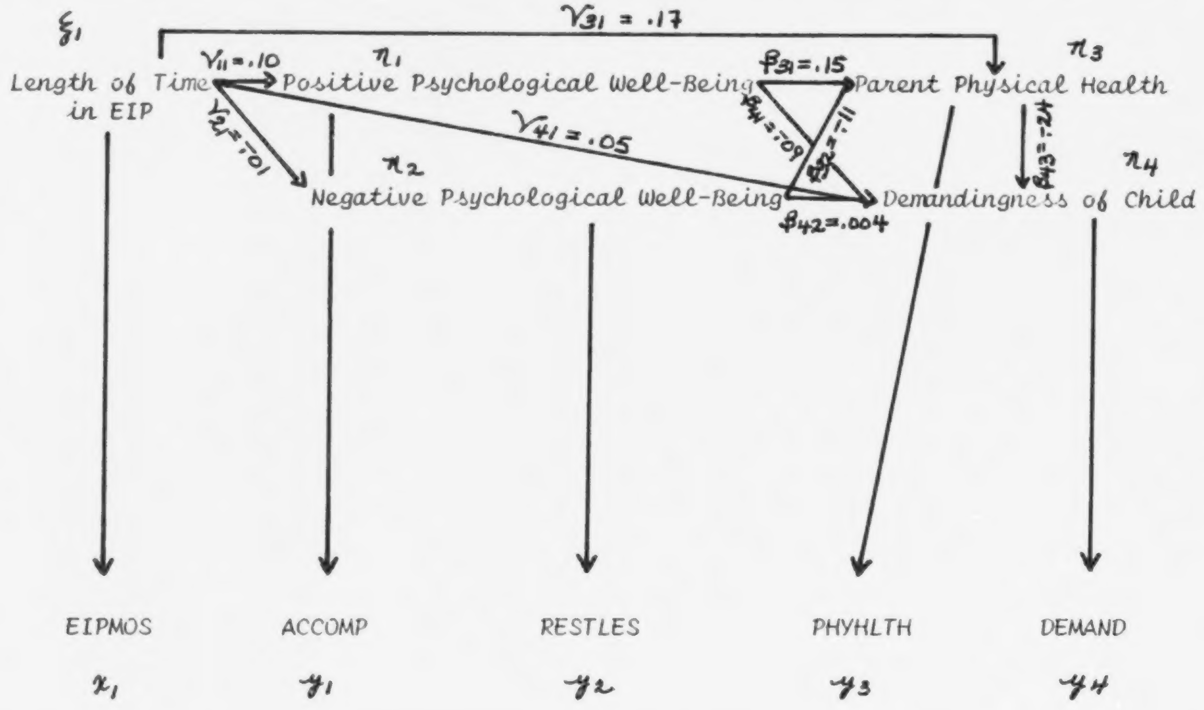

ξ_1
Length of Time in EIP
$\gamma_{31} = .17$
$\gamma_{11} = .10$
η_1
Positive Psychological Well-Being
$\gamma_{21} = -.01$
$\gamma_{41} = .05$
η_2
Negative Psychological Well-Being
$\beta_{31} = .15$
$\beta_{41} = -.09$
$\beta_{32} = -.11$
$\beta_{42} = .004$
η_3
Parent Physical Health
$\beta_{43} = -.24$
η_4
Demandingness of Child
EIPMOS
x_1
ACCOMP
y_1
RESTLES
y_2
PHYHLTH
y_3
DEMAND
y_4

Figure 21. Standardized Effects for Model C1T

$\chi^2_{2df} = 2.89$ (PROB. = 0.236)

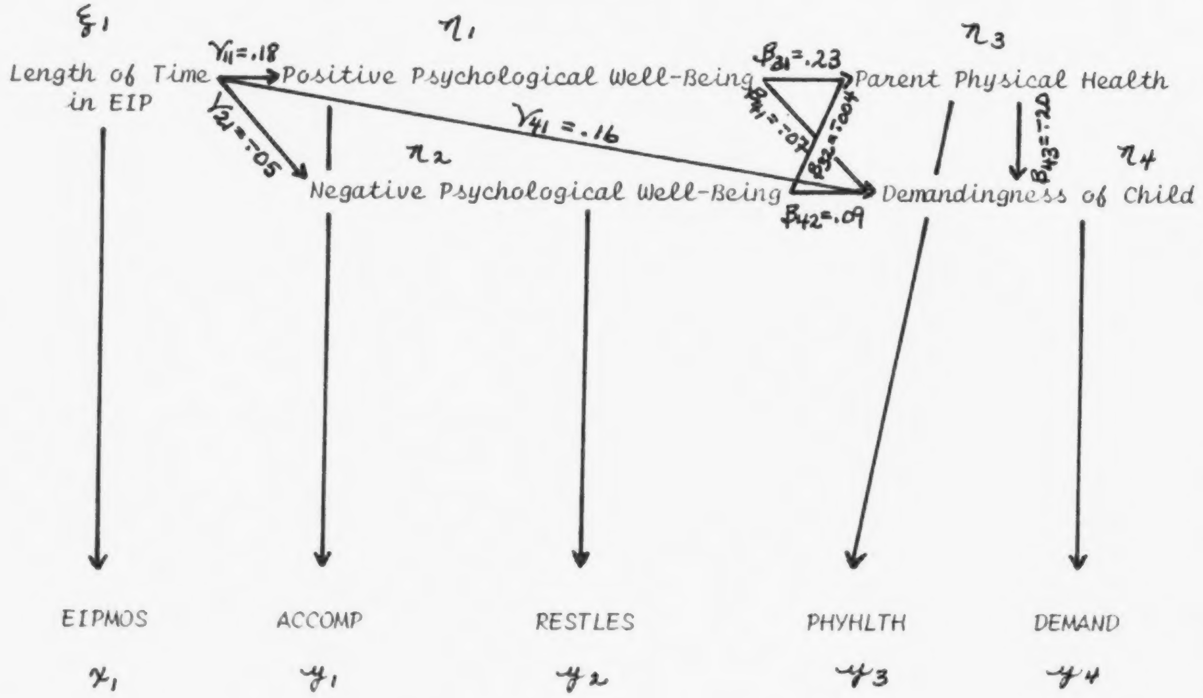

ξ_1
Length of Time in EIP
$\gamma_{11} = .18$
η_1
Positive Psychological Well-Being
$\gamma_{21} = -.05$
$\gamma_{41} = .16$
η_2
Negative Psychological Well-Being
$\beta_{31} = .23$
$\beta_{41} = -.07$
$\beta_{32} = -.004$
$\beta_{42} = .09$
η_3
Parent Physical Health
$\beta_{43} = -.20$
η_4
Demandingness of Child
EIPMOS
x_1
ACCOMP
y_1
RESTLES
y_2
PHYHLTH
y_3
DEMAND
y_4

Figure 22. Standardized Effects for Model C4T

$$\chi^2_{2df} = 3.17 \text{ (PROB. = 0.205)}$$

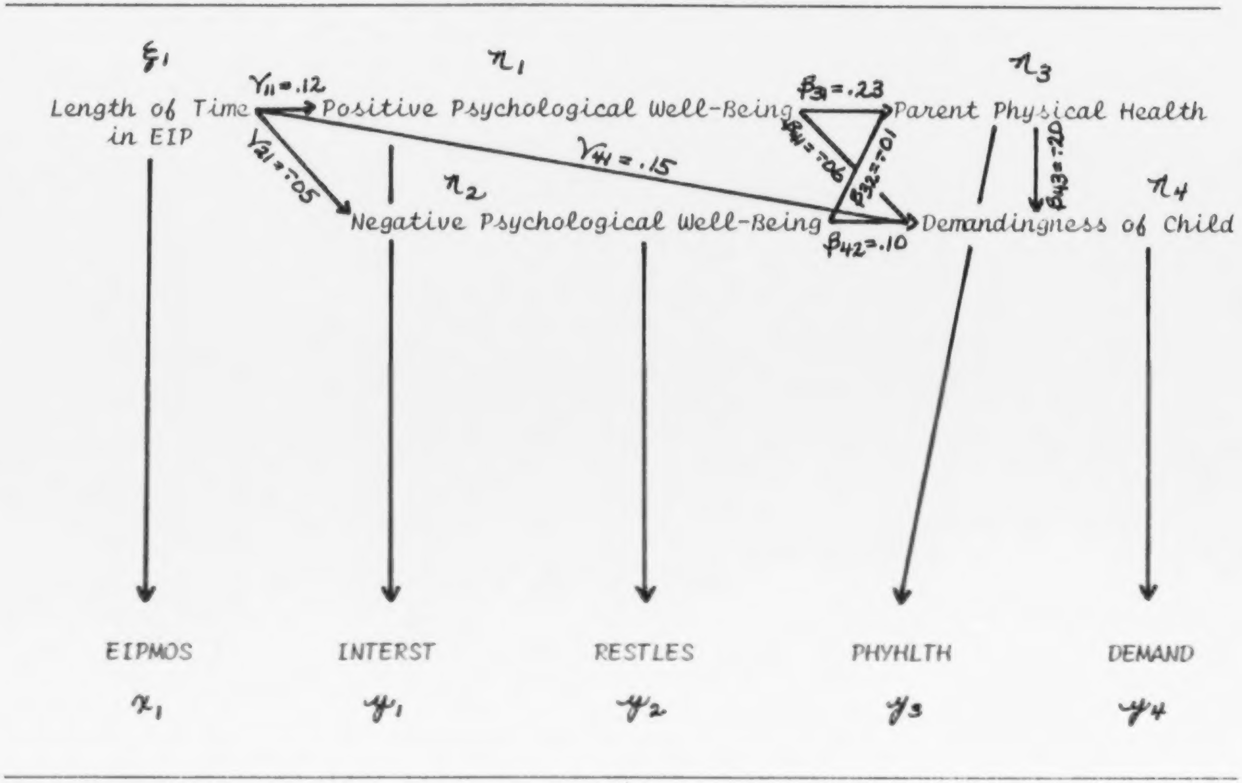
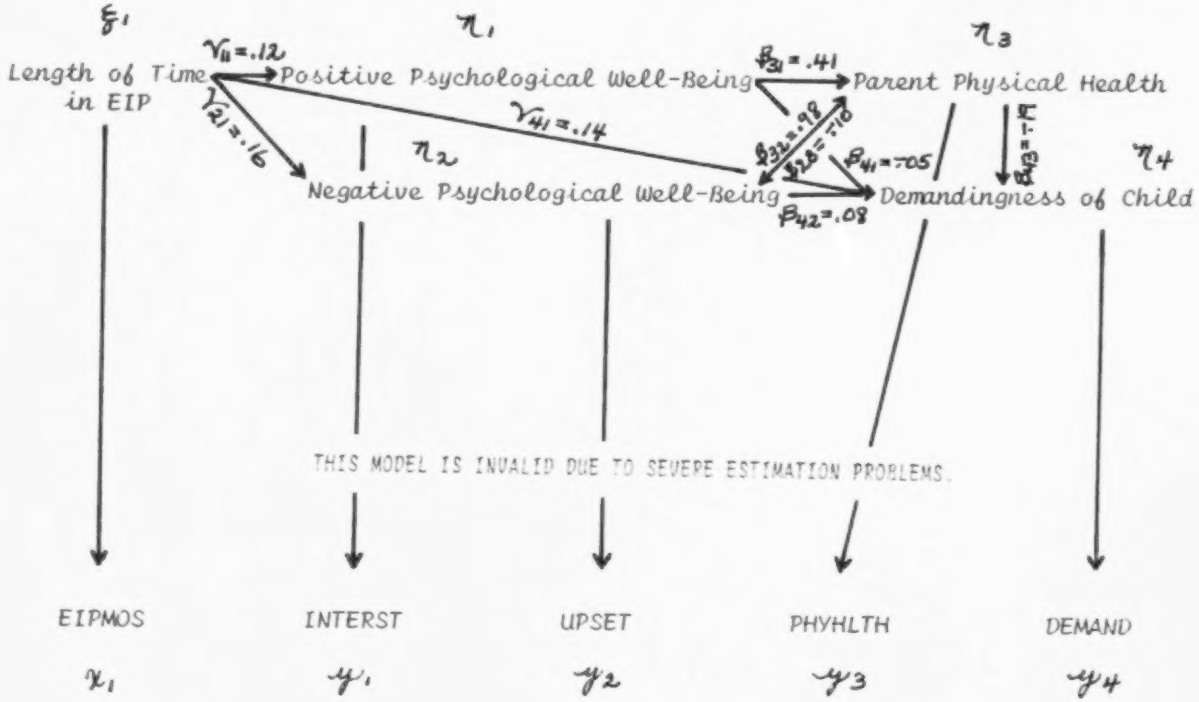

ξ_1
Length of Time in EIP
η_1
Positive Psychological Well-Being
η_2
Negative Psychological Well-Being
η_3
Parent Physical Health
η_4
Demandingness of Child
$\gamma_{11} = .12$
$\gamma_{21} = -.05$
$\gamma_{41} = .15$
$\beta_{31} = .23$
$\beta_{41} = -.06$
$\beta_{32} = -.01$
$\beta_{42} = .10$
$\beta_{43} = -.20$
EIPMOS
x_1
INTERST
y_1
RESTLES
y_2
PHYHLTH
y_3
DEMAND
y_4

Figure 23. Standardized Effects for Model C3T / C6T

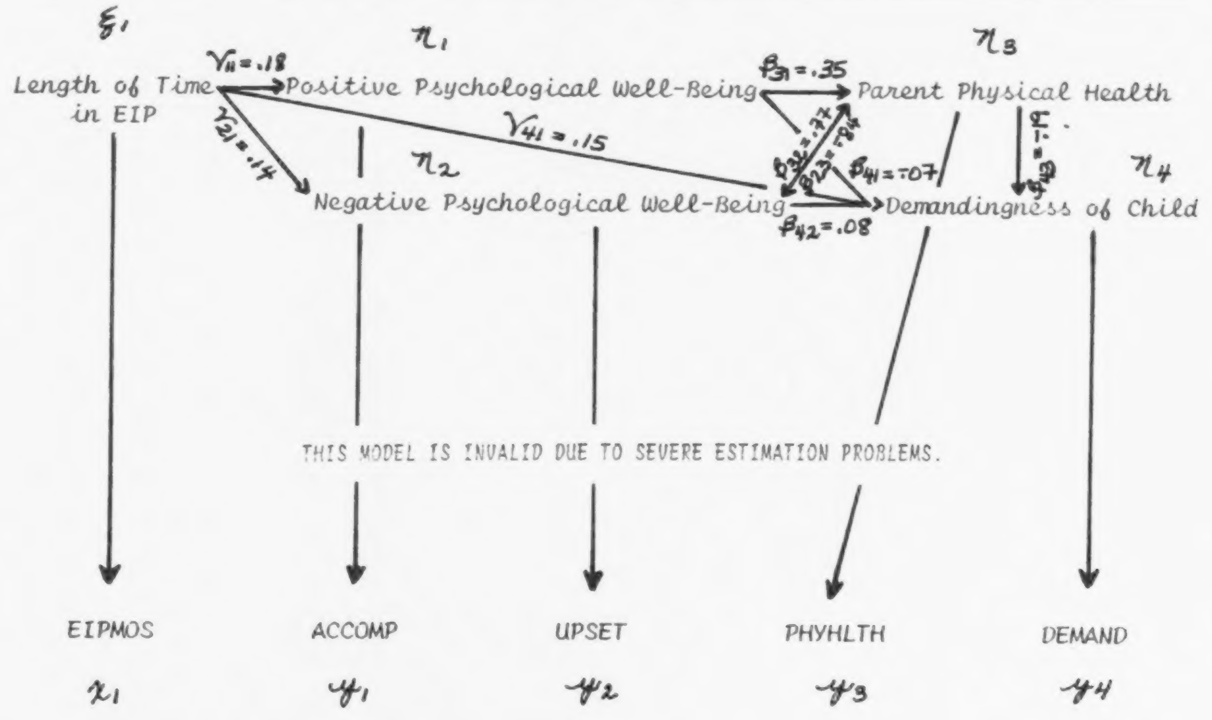
$\chi^2_{1df} = 0.45$ (PROB. = 0.500)


ξ_1
Length of Time in EIP
$\gamma_{11} = .12$
$\gamma_{21} = .16$
η_1
Positive Psychological Well-Being
η_2
Negative Psychological Well-Being
$\gamma_{41} = .14$
$\beta_{31} = .41$
$\beta_{32} = .98$
$\beta_{23} = -.10$
$\beta_{41} = -.05$
$\beta_{42} = .08$
$\beta_{43} = -.15$
η_3
Parent Physical Health
η_4
Demandingness of Child
EIPMOS
INTERST
UPSET
PHYHLTH
DEMAND
x_1
y_1
y_2
y_3
y_4

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Figure 24. Standardized Effects for Model C2T / C7T

$\chi^2_{1df} = 0.46$ (PROB. = 0.500)


ξ_1
Length of Time in EIP
η_1
Positive Psychological Well-Being
η_2
Negative Psychological Well-Being
η_3
Parent Physical Health
η_4
Demandingness of Child
$\gamma_{11} = .18$
$\gamma_{21} = .14$
$\gamma_{41} = .15$
$\beta_{31} = .35$
$\beta_{32} = .77$
$\beta_{23} = .84$
$\beta_{41} = -.07$
$\beta_{42} = .08$
$\beta_{43} = .18$
EIPMOS
ACCOMP
UPSET
PHYHLTH
DEMAND
x_1
y_1
y_2
y_3
y_4

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

from 0.07-0.116. The revised models C6T and C7T showed negative R^2 values for eta2 and eta3. Overall the C Models explained very little about the variability of the key concepts.

Evidence of Estimation Problems

The revised models C6T and C7T were most difficult for LISREL to estimate as evidenced by PSI diagonals greater than 1.0, and the high number of iterations required (16-18) for Maximum Likelihood Estimates. In Model C6T the Two Stage Least Squares Estimate for BE(3,2) was more reasonable than the Maximum Likelihood Estimate, i.e. -0.145 versus 1.039. The other six C Models were apparently estimated with little difficulty, i.e. matrices of measurement error variance were appropriate; PSI diagonals were less than 1.0; number of iterations ranged from 2-4; initial estimates were close to final estimates; and there were low correlations among the eta and parameter estimates.

The D Model

There was only one version of Model D estimated with program data (indicators of the concept "Positive Parenting Experiences" were measured on the Treatment and Pre-Treatment parents only, so the Control Group could not be used with this model).

Covariance Matrix

Refer to Table 65 for the Covariance (**S**) Matrix used with Model D1P.

Estimates of Effects

Refer to Table 66 for the Unstandardized Estimates of Effects using Maximum Likelihood Estimation. Note that the direction of some effects is opposite to that expected.

Standardized Solution

Refer to Figure 25 for the Standardized Beta and Gamma Effects.

Goodness of Model Fit

The Chi-Square and Level of Probability for Model D1P are reported with the Maximum Likelihood Estimates and the Standardized Effects. This model has a non-significant Chi-Square, and a 0.507 Probability Level indicating there is a 50% chance of finding the same **S** matrix again.

Model Modification Indices

Since the Chi-Square value was non-significant on the first trial, the LISREL suggested modifications were not implemented (i.e. modeling a loop between the three eta concepts; modeling a direct relationship between ksi1 and eta2; and freeing the relationships among the psi parameters and theta epsilon parameters).

Total Direct and Indirect Effects

The analysis of Model D showed that "Length of Time in the Early Intervention Program" had a net negative impact on each of the dependent variables. The magnitudes of impact ranged from -0.002--0.007.

Analysis of Residual Covariances

The Q-Plot for Model D1P was perfectly linear at 90^o with one outlier. The largest Standardized Residual was at EIPMOS and ATTACH, i.e. the relationship between "Length of Time in the Early Intervention Program" and "Parent-Child Attachment" was not modeled accurately according to the data collected.

Standard Error and T-Values

The Standard Error in Model D1P was small except for PH(1,1). T-Values are reported with Maximum Likelihood Estimates. Note that the program effects failed to reach significance.

Table 65

Covariance Matrix for Model D1P

	HAPPYOC	ATTACH	COMPET	EIPMOS
HAPPYOC	.47	-.13	.09	-.37
ATTACH	-.13	1.26	.09	-.72
COMPET	.09	.09	.32	-.66
EIPMOS	-.37	-.72	-.66	89.48

Table 67

Covariance Matrix for Model E1P / E2P

	MASTERY	ACCEPT	DEPRESS	ENTRYAGE
MASTERY	.94	.29	.31	.62
ACCEPT	.29	1.50	.33	.45
DEPRESS	.31	.33	.82	-.02
ENTRYAGE	.62	.45	-.02	58.31

Table 66

Maximum Likelihood Estimates for Model D1P

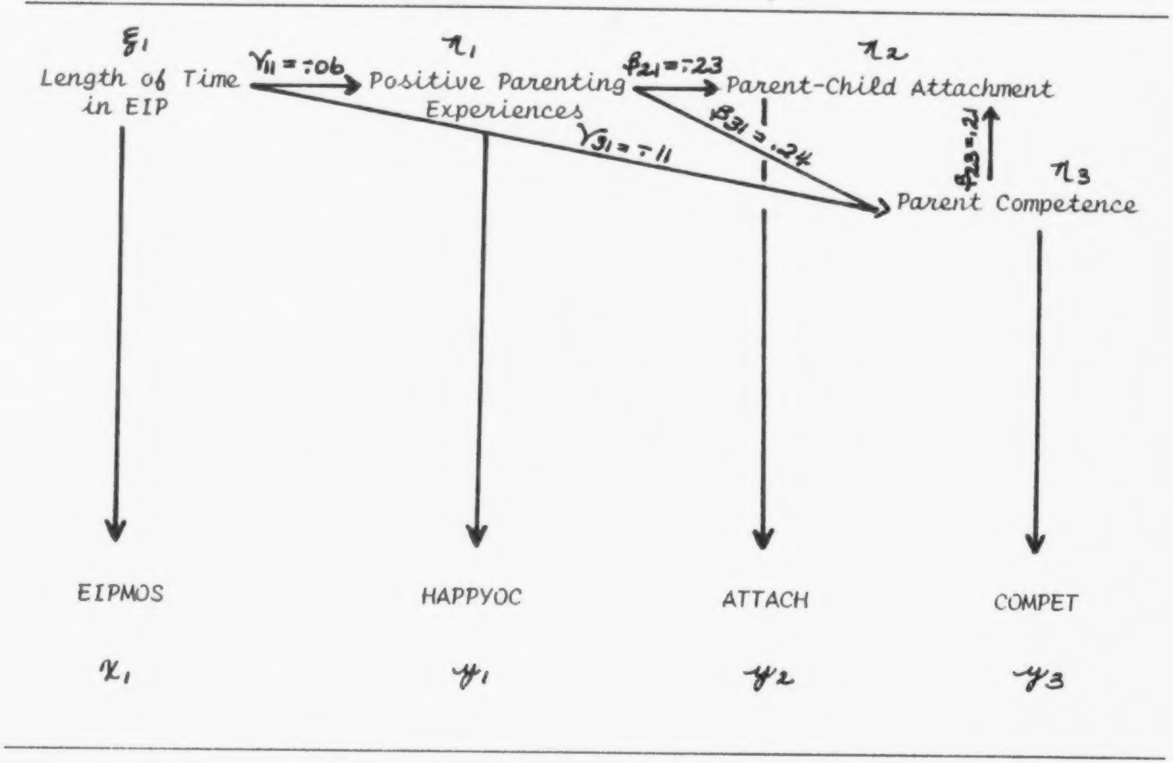
Coefficient	MLE	T-Value
BE(2,1)	-0.39	-2.5
BE(2,3)	0.41	2.2
BE(3,1)	0.20	2.7
GA(1,1)	-0.004	-0.6
GA(3,1)	-0.01	-1.3
PH(1,1)	88.59	8.0
PS(1,1)	0.44	7.6
PS(2,2)	1.11	7.6
PS(3,3)	0.29	7.6

CHI-SQUARE with 1 degree of freedom is 0.44

PROBABILITY LEVEL is 0.507

Figure 25. Standardized Effects for Model D1P

$\chi^2_{1df} = 0.44$ (PROB. = 0.507)


ξ_1
Length of Time in EIP
$\gamma_{11} = -.06$
η_1
Positive Parenting Experiences
$\gamma_{31} = -.11$
$\beta_{21} = -.23$
η_2
Parent-Child Attachment
$\beta_{31} = .24$
$\beta_{23} = .21$
η_3
Parent Competence
EIPMOS
HAPPYOC
ATTACH
COMPET
x_1
y_1
y_2
y_3

Proportion of Variance Explained by the Model

The Maximum Likelihood Squared Multiple Correlation (R^2) for eta1 was 0.003; R^2 for eta2 was 0.074; and the R^2 for eta3 was 0.074. Overall Model D explained very little about the variability of the endogenous concepts.

Evidence of Estimation Problems

There was no evidence of estimation difficulties with this model. Initial estimates were close to final Maximum Likelihood Estimates; only two iterations were required. All estimates were reasonable with respect to magnitude despite the unexpected directions of impact.

The E Model

There was only one version of Model E analyzed with program data. Note that the exogenous / independent variable for this model was "Child's Age at First Referral to the Early Intervention Program", rather than "Length of Time in the Early Intervention Program".

Covariance Matrix

Refer to Table 67 for the Covariance Matrix used with Model E1P.

Estimates of Effects

Refer to Table 68 for the Unstandardized Estimates of Effects using Maximum Likelihood Estimation. Note that the direction of some effects is opposite to that expected.

Standardized Solution

Refer to Figure 26 for the Standardized Beta and Gamma Effects.

Goodness of Model Fit

The Chi-Square and Level of Probability are reported with the Maximum Likelihood Estimates, and the Standardized Effects. Note that the Chi-Square value for Model E1P is non-significant, with a 75% probability of finding similar data if the model is true.

Model Modification Indices

The LISREL suggested modifications to the model were not implemented because the Chi-Square value was non-significant on the first trial.

Total Direct and Indirect Effects

The analysis of Model E1P showed that the net effect of "Child's Age at First Referral to the Program" was positive for parents' "Perception of

Table 68

Maximum Likelihood Estimates for Model E1P / E2P

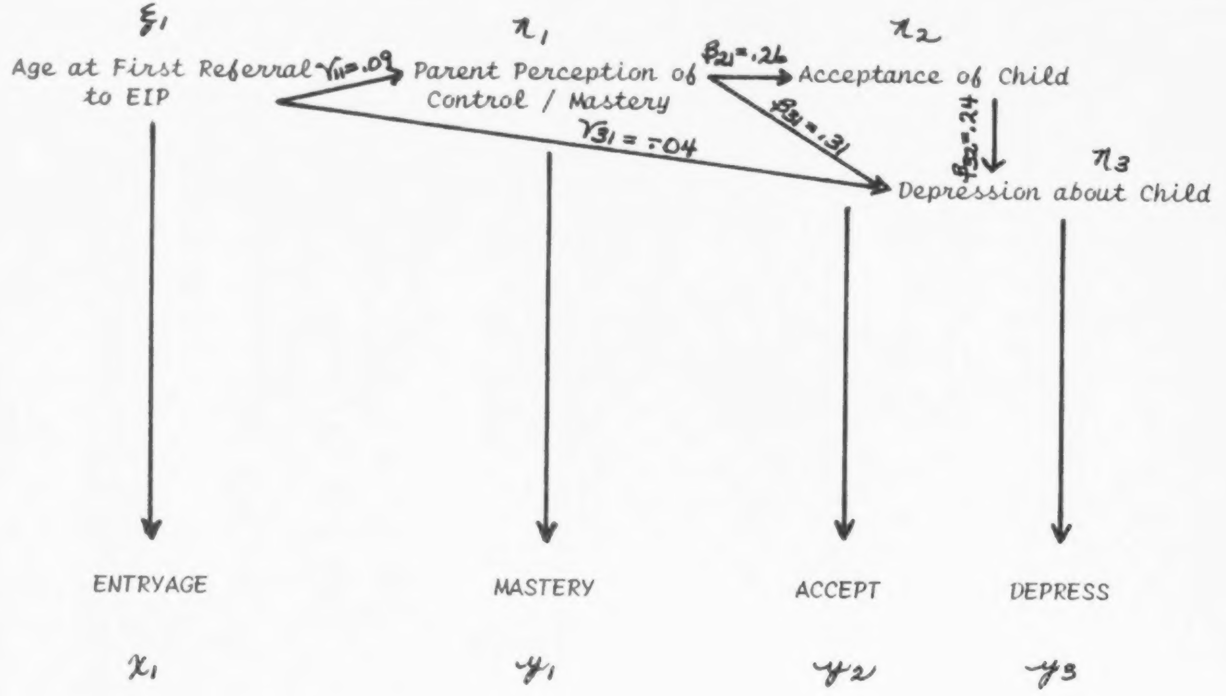
Coefficient	MLE	T-Value
BE(2,1)	0.33	3.0
BE(3,1)	0.29	3.6
BE(3,2)	0.18	2.8
GA(1,1)	0.01	1.0
GA(3,1)	-0.01	-0.5
PH(1,1)	57.73	8.1
PS(1,1)	0.89	7.8
PS(2,2)	1.33	7.7
PS(3,3)	0.63	7.6

CHI-SQUARE with 1 degree of freedom is 0.10

PROBABILITY LEVEL is 0.75

Figure 26. Standardized Effects for Model E1P / E2P

$\chi^2_{1df} = 0.10$ (PROB. = 0.75)


ξ_1
Age at First Referral to EIP
$\gamma_{11} = .09$
η_1
Parent Perception of Control / Mastery
$\gamma_{31} = -.04$
$\beta_{21} = .26$
η_2
Acceptance of Child
$\beta_{31} = .31$
$\beta_{32} = .24$
η_3
Depression about Child
ENTRYAGE
MASTERY
ACCEPT
DEPRESS
x_1
y_1
y_2
y_3

Mastery and Control" and "Acceptance of the Child" (i.e. as ENTRYAGE increased so too did MASTERY and ACCEPT). The net effect of ENTRYAGE on DEPRESS was negative (i.e. the earlier the child was referred the more depressed the parents became).

Analysis of Residual Covariances

The Q-Plot for this model was nearly 90° linear with two outliers. The largest Standardized Residual was for ENTRYAGE and ACCEPT; all other residuals were close to zero.

Standard Error and T-Values

The Standard Errors in Model E were low except for PH(1,1) and PSI diagonals. The T-Values are reported with the Maximum Likelihood Estimates. Note that the Early Intervention Program effects failed to reach significance.

Proportion of Variance Explained by the Model

The Maximum Likelihood Multiple Correlation (R^2) for eta1 was 0.008; R for eta2 was 0.068; and R^2 for eta3 was 0.19. Overall Model E explains very little about the variability of the endogenous concepts.

Evidence of Estimation Problems

There was no evidence of estimation problems with this model, i.e. all estimates were reasonable with respect to magnitude even though the directions of effect were unexpected. Initial estimates were close to final estimates; six iterations were required. The correlations among the eta and parameter estimates were low.

The F Models

One version of Model F was analyzed with the program data set and the total data set; two F Models were therefore generated.

Covariance Matrices

Refer to Tables 69-70 for the Covariance ($\mathbf{S}$) Matrices used with the F Models.

Estimates of Effects

Refer to Tables 71-72 for the Unstandardized Estimates of Effects using Maximum Likelihood Estimation. Note that the direction of some effects is opposite to that expected.

Standardized Solution

Refer to Figures 27-28 for the Standardized Beta and Gamma Effects.

Goodness of Model Fit

The Chi-Square and Level of Probability for each Model F, are reported with the Maximum Likelihood Estimates and the Standardized Effects. Note that both models have a non-significant Chi-Square, with Probability Levels ranging from 0.157-0.228.

Model Modification Indices

Model F1P became F2P and then F3P after incremental application of LISREL recommended modifications. Model F3P estimates parameters for GA(4,1) BE(1,2) BE(1,3) and BE(4,5), in addition to the coefficients specified in Model F1P.

Model F1T became F2T and then F3T after incremental application of LISREL recommended modifications. Model F3T estimates parameters for GA(4,1) GA(5,1) GA(6,1) BE(1,2) and BE(1,3), in addition to the coefficients specified in Model F1T.

All of these substantive changes could be defended theoretically (or at least argued logically).

Total Direct and Indirect Effects

Both Models F3P and F3T showed that "Length of Time in the Early Intervention Program" had a net negative impact on "Mutuality of Family Roles", and

"Level of Family Stress". Both analyses showed that "Length of Time in the Early Intervention Program" had a net positive effect on "Ability to Problem-Solve", "Ability to Reframe Problems", and "Reinforcement from Child". The model analyses differed in the direction of program effect on "Demandingness of Child". The magnitude of total effects ranged from 0.002-0.021.

Analysis of Residual Covariances

The Q-Plots for the F Models were non-linear with outliers beyond 1.0 standard deviations from the mean (all points were within 2.0 standard deviations from the mean).

The largest residuals were with the relationships between DEMAND, REFRAME, and MUTUAL.

Standard Error and T-Values

The Standard Errors in the F Models were small except for PH(1,1) and the PSI diagonals. T-Values are reported with the Maximum Likelihood Estimates. Note that many of the Early Intervention Program effects failed to reach significance.

Proportion of Variance Explained by the Models

The Maximum Likelihood Squared Multiple Correlations (R^2) for eta1 ranged from 0.241-0.294;

Table 69

Covariance Matrix for Model F1P / F3P

	PROBSOL	REFRAME	MUTUAL	STRESS	DEMAND	APPREC	EIPMOS
PROBSOL	.84	.31	-.40	-.26	-.17	-.03	1.08
REFRAME	.31	.81	-.13	-.13	-.14	-.06	.19
MUTUAL	-.40	-.13	1.06	.39	.28	.07	-.70
STRESS	-.26	-.13	.39	.76	.12	.04	-2.10
DEMAND	-.17	-.14	.28	.12	1.35	-.20	.02
APPREC	-.03	-.06	.07	.04	-.20	.41	.27
EIPMOS	1.08	.19	-.70	-2.10	.02	.27	89.48

Table 70

Covariance Matrix for Model F1T / F3T

	PROBSOL	REFRAME	MUTUAL	STRESS	DEMAND	APPREC	EIPMOS
PROBSOL	.80	.32	-.31	-.23	-.11	.01	.80
REFRAME	.32	.86	-.12	-.16	-.10	.03	.95
MUTUAL	-.31	-.12	1.08	.31	.17	.00	-.79
STRESS	-.23	-.16	.31	.79	.15	-.03	-1.33
DEMAND	-.11	-.10	.17	.15	1.08	-.17	.91
APPREC	.01	.03	.00	-.03	-.17	.50	.75
EIPMOS	.80	.95	-.79	-1.33	.91	.75	64.64

Table 71

Maximum Likelihood Estimates for Model F1P / F3P

Coefficient	MLE	T-Value
BE(1,2)	0.34	4.3
BE(1,3)	-0.35	-5.0
BE(4,1)	-0.13	-1.3
BE(4,2)	-0.09	-1.0
BE(4,3)	0.38	4.5
BE(4,5)	-0.26	-1.96
BE(5,4)	0.60	2.4
BE(6,4)	0.09	1.3
BE(6,5)	-0.16	-3.3
GA(1,1)	0.01	1.2
GA(2,1)	0.002	0.3
GA(3,1)	-0.01	-0.8
GA(4,1)	-0.02	-2.4
PH(1,1)	88.59	8.0
PS(1,1)	0.55	7.3
PS(2,2)	0.77	7.6
PS(3,3)	1.00	7.6
PS(4,4)	0.60	5.2
PS(5,5)	1.39	5.8
PS(6,6)	0.35	7.5

CHI-SQUARE with 8 degrees of freedom is 10.55

PROBABILITY LEVEL is 0.228

THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.

Table 72

Maximum Likelihood Estimates for Model F1T / F3T

Coefficient	MLE	T-Value
BE(1,2)	0.35	6.7
BE(1,3)	-0.26	-5.7
BE(4,1)	-0.15	-2.4
BE(4,2)	-0.08	-1.4
BE(4,3)	0.24	4.7
BE(5,4)	0.24	3.4
BE(6,4)	0.02	0.5
BE(6,5)	-0.18	-4.4
GA(1,1)	0.004	0.7
GA(2,1)	0.02	2.2
GA(3,1)	-0.01	-1.6
GA(4,1)	-0.02	-2.5
GA(5,1)	0.02	2.6
GA(6,1)	0.02	2.9
PH(1,1)	64.00	12.1
PS(1,1)	0.57	11.3
PS(2,2)	0.80	11.6
PS(3,3)	1.01	11.6
PS(4,4)	0.61	11.4
PS(5,5)	0.97	11.6
PS(6,6)	0.43	11.5

CHI-SQUARE with 7 degrees of freedom is 10.60

PROBABILITY LEVEL is 0.157

Figure 27. Standardized Effects for Model F1P/F3P

$\chi^2_{8df} = 10.55$ (PROB. = 0.228)

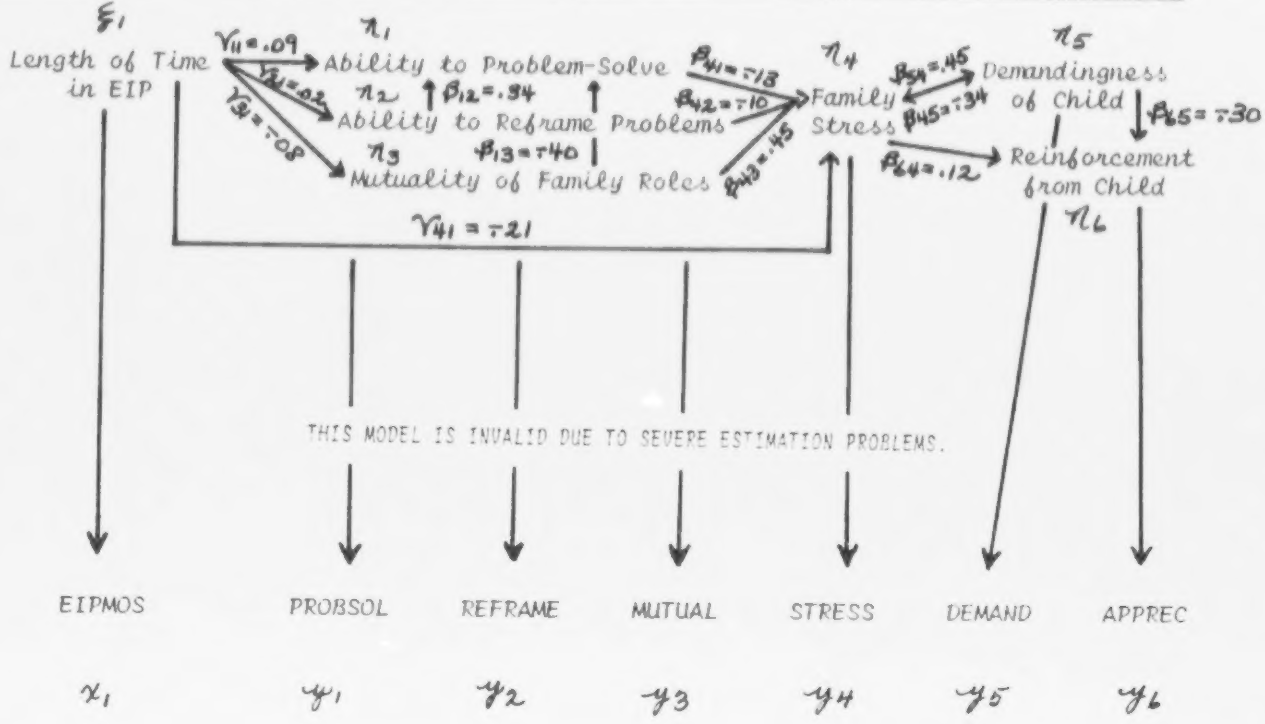
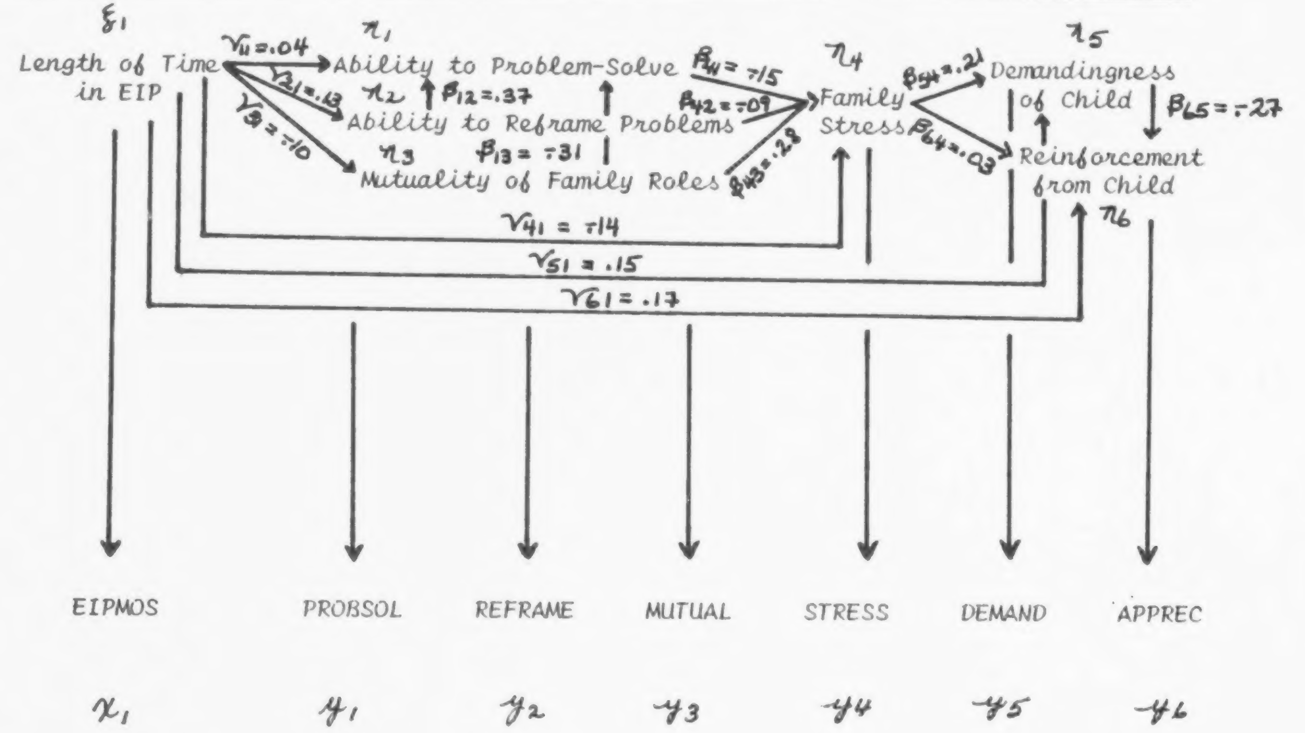

ξ_1
Length of Time in EIP
$\gamma_{11} = .09$
$\gamma_{21} = .02$
$\gamma_{31} = -.08$
η_1
Ability to Problem-Solve
η_2
$\beta_{12} = .34$
Ability to Reframe Problems
η_3
$\beta_{13} = -.40$
Mutuality of Family Roles
$\gamma_{41} = -.21$
$\beta_{41} = -.13$
$\beta_{42} = -.10$
$\beta_{43} = .45$
η_4
Family Stress
$\beta_{54} = .45$
$\beta_{45} = -.34$
$\beta_{64} = .12$
η_5
Demandingness of Child
$\beta_{65} = -.30$
Reinforcement from Child
η_6
THIS MODEL IS INVALID DUE TO SEVERE ESTIMATION PROBLEMS.
EIPMOS
PROBSOL
REFRAME
MUTUAL
STRESS
DEMAND
APPREC
x_1
y_1
y_2
y_3
y_4
y_5
y_6

Figure 28. Standardized Effects for Model F1T / F3T

$\chi^2_{7df} = 10.60$ (PROB. = 0.157)


ξ_1
Length of Time in EIP
$\gamma_{11}=.04$
$\gamma_{21}=.13$
$\gamma_{31}=-.10$
η_1 Ability to Problem-Solve
η_2 Ability to Reframe Problems
η_3 Mutuality of Family Roles
$\beta_{12}=.37$
$\beta_{13}=-.31$
$\beta_{41}=-.15$
$\beta_{42}=-.09$
$\beta_{43}=.28$
η_4 Family Stress
$\beta_{54}=.21$
$\beta_{64}=.03$
η_5 Demandingness of Child
$\beta_{65}=-.27$
Reinforcement from Child η_6
$\gamma_{41}=-.14$
$\gamma_{51}=.15$
$\gamma_{61}=.17$
EIPMOS
PROBSOL
REFRAME
MUTUAL
STRESS
DEMAND
APPREC
x_1
y_1
y_2
y_3
y_4
y_5
y_6

the R^2 for eta2 ranged from 0.001-0.017; the R^2 for eta3 ranged from 0.006-0.01; the R^2 for eta4 ranged from 0.158-0.183; and the R^2 for eta6 ranged from 0.086-0.094. The R^2 for eta5 was 0.053 for Model F3T, and -0.088 for Model F3P. Overall the F Models explain very little about the variance of the endogenous concepts.

Evidence of Estimation Problems

Model F3T had no apparent estimation difficulties. There were some estimation problems with Model F3P as evidenced by the large PSI diagonals (i.e. greater than 1.0) in the Standardized Solution. Although the initial estimates were close to the final estimates for this model, nine iterations were required to estimate the coefficients. Correlations among the eta and parameter estimates were low for both models.

The Longitudinal Model

One of the twenty models described above was selected as the "best" cross-sectional model, for re-estimation as a true longitudinal model. Model C2P was chosen because it had the most acceptable estimates of program effect (i.e. with respect to magnitude and direction) and a non-significant χ^2; see Appendix XLVII.

The Longitudinal Model hypothesized (as did Model C2P) that increased "Length of Time in the Early Intervention Program" caused parents to have increased "Positive Psychological Well-Being", and decreased "Negative Psychological Well-Being". The increase in "Positive Psychological Well-Being" was theorized to increase "Parent Physical Health", and decrease the perceived "Demandingness of the Child". The decrease in "Negative Psychological Well-Being" was also hypothesized to increase "Parent Physical Health", and decrease the perceived "Demandingness of the Child". Increased "Length of Time in the Early Intervention Program" was also thought to impact the perceived "Demandingness of the Child", through other mechanisms not addressed in this model.

The Longitudinal Model also hypothesized that the level of "Positive Psychological Well-Being" at Time1, impacted the level at Time2, which in turn had an impact on the level at Time3. Similarly, the levels of "Negative Psychological Well-Being", "Parent Physical Health", and perceived "Demandingness of the Child" at Time1, all had an effect on the levels seen at Time2, which had effects on the levels at Time3. The "Length of Time in the Early Intervention Program" at Time1 was modeled as being correlated with that at Time2 and Time3.

This Longitudinal Model contained 15 conceptual variables (3 ksi and 12 eta), each with a single observable indicator with measurement scale set to 1.0. LISREL was asked to provide 50 estimates of effect (i.e. 23 beta, 9 gamma, 6 phi, and 12 psi). The measurement error in this model was handled as it was in the other models, i.e., X variables were estimated to have 1% error, and Y variables were estimated to have 5% error. The original longitudinal data file (i.e. Appendix XXV versus Appendix XXVI) was used with this model, since it separated Time1 from Time2 from Time3 measures; only Treatment and Pre-Treatment cases were used for this model (n=78).

LISREL was unable to estimate this triple time series model, giving the error message "Data Matrix Not Positive Definite". Routine checks of the Covariance Matrix and Command Files failed to reveal the problem, so the model was simplified and re-attempted several times (i.e. first as a single time series, then with successive additions of single variables). The most complex model LISREL could estimate, was with one ksi (EIPMOS1) and all 12 eta (ACCOMP1,2,3 UPSET1,2,3 PHYHLTH1,2,3 and DEMAND1,2,3). (The analyses of these results i.e. Chi-square, estimates of effects, etc., are not presented because this final model is not theoretically relevant). The estimation problem was therefore determined to be with the variables EIPMOS2 and EIPMOS3.

Close examination of the data under these two variables revealed some peculiarities and limitations, that were possibly the basis of the failure in model estimation. Specifically, the minimum pairwise number by Time3 was only nine -- an insufficient number of cases, in view of the number of estimates requested. Because of this dropout rate, the range and average number of months in the program were similar across all three times (i.e. the people responding at Times 2 and 3 had not been in the program longer than those responding at Time1).

Although longitudinal modeling provides more complete information on the specific mechanisms of program impact, this was not pursued because of the complex data and estimation problems.

Discussion

Twenty LISREL structural equation models were estimated, analyzed and modified within theoretical constraints, until non-significant Chi-Square values were achieved. Nine of these twenty models evidenced severe estimation problems with PSI values greater than 1.0 in the Standardized Solution. These estimations of conceptual error on eta are theoretical impossibilities (i.e. LISREL is saying the error variance is greater than 100%). The nine models that contained these "wild" and unbelievable estimates must be considered completely invalid (i.e. none of the estimates obtained can be trusted), and disqualified from the summary of findings. The nine problematic models were: the six A Models; Model C3T/C6T; Model C2T/C7T; and Model F3P. (The invalid models have been labelled as such in the Tables of Maximum Likelihood Estimates and Figures of Standardized Effects, and these models have been subsequently eliminated in the Discussion.)

The remaining eleven valid models revealed mixed findings about the impact of the Early Intervention Program, on family stress and coping with a young handicapped child. These models all had non-significant Chi-Square values, indicating probable support from the data collected.

The Statistically Significant Program Impacts

If only those direct program effects that reached statistical significance are isolated and examined (i.e. the Gamma effects that had a T-Value greater than or equal to ±2.0 in the valid models), one finds six significant effects from the program. Two of these significant program effects were substantiated by more than one model.

Specifically, Models C1T and C4T both showed a significant positive program impact on "Positive Psychological Well-Being", i.e. as "Length of Time in the Early Intervention Program" increased so too did parents' "Positive Psychological Well-Being". The other four valid C Models also revealed a positive, albeit non-significant causal relationship between these two variables.

Models C1T, C4T, and F1T/F3T each revealed a significant positive program impact on perceived "Demandingness of the Child", i.e. as "Length of Time in the Early Intervention Program increased so too did parents' perceived "Demandingness of the Child". The other four valid C Models also showed a positive, albeit non-significant causal relationship between these two variables.

Since these two significant program effects were substantiated by more than one structural equation model, they are highly believable. The program effect on parents' "Positive Psychological Well-Being" was expected and predicted by theory. However, the effect of the program on parents' preception of "Demandingness of the Child" was opposite to what is hypothesized by early intervention theory. There are two competing explanations for this unexpected / unintended result. One could argue for instance that the Early Intervention Program was putting extra parenting demands on the families, and failing to help them find ways to cope with the extra work of raising a handicapped child. This possibility would certainly result in increased parent perception of child demandingness over time.

The alternative and perhaps better explanation, lies with the limitations of the control and comparison groups used in this study. Neither the Pre-Treatment or Control Group families provided a completely adequate comparison for the Treatment Group families. Most of the Pre-Treatment families would not yet have had time to develop an unusually strong feeling of child demandingness, because of the young age of the baby and the preventive aspects of the program. The Control Group families did not have a handicapped child who made extra demands on their time and attention. It is logical then to expect the Treatment Group families to exhibit more problems over time, when compared to these two groups. This particular outcome on child demandingness may simply be a function of the program failing to be 100% effective, in counteracting a naturally occuring and progressive problem in the Treatment Group families (i.e. 100% effectiveness would mean the Treatment Group families had to score the same or better, than the other groups of families -- otherwise the models would show deterioration over time).

Since there was no equivalent control group which had a handicapped child but failed to receive the program, there is no way of determining just how ineffective the program really was with this particular outcome (e.g. any point between 98% effectiveness to causing outright harm, would show as deterioration over time in these models). It is possible that although the Treatment Group families were somewhat worse off in comparison to the other two groups, they may have been very much worse off if they had no program at all.

Analyses of the eleven valid structural equation models revealed four other statistically significant program effects, but these were not found as consistently across the models. Specifically, Model B1P showed a significant negative program effect on parents' "Use of Formal Supports"; however in Model B1T "Length of Time in the Early Intervention Program" had a mildly positive impact on "Use of Formal Supports".

Model F1T/F3T showed significant positive program effects on parents' "Ability to Reframe Problems", and parents' perception of "Reinforcement from the Child". Model F3T also showed a significant negative program impact on "Level of Family Stress", i.e. as "Length of Time in the Early Intervention Program" increased, parents' reports of high "Level of Family Stress" decreased.

These "once only" findings of significant program impact should be accepted with caution because they have not been replicated in other models, and may arise from sampling fluctuation or modeling and design problems.

The Statistically Non-Significant Program Impacts

The numerous other Early Intervention Program effects that were modeled (i.e. direct impact on "Parental Depression", "Frequency of Positive Parenting Experiences", "Parent Competence", "Restrictiveness of Parenting Role", "Perception of Control / Mastery", "Mutuality of Family Roles", "Ability to Problem-Solve", "Parent Physical Health', and "Negative Psychological Well-Being"), all failed to reach statistical significance as evidenced by a T-Value less than ±2.0. (This means that the Early Intervention Program had a neutral impact in these critical outcome areas.) These mildly negative / mildly positive non-significant Gamma effects, were frequently contradicted by the estimates obtained in the competing models. In several models, the direction of program impact was contrary to theoretical expectation.

It is easy to look at the Standardized Beta and Gamma Effects in Figures 9-28, and conclude that "over time the families in the Early Intervention Program are not doing very well". The non-significant program impacts however, need to be interpreted with caution. To state the obvious, statistically non-significant program results should not be taken as seriously as ones that reach statistical significance. Again sampling fluctuations across time; use of pairwise deletion of missing values; use of alternate indicators; poor causal modeling; use and limitations of the control / comparison groups, could all contribute to these poor or contradictory estimates.

The Indirect Program Impacts

The indirect program effects that were modeled (i.e. impact on "Financial Security", "Marital Conflict about the Child", "Parent-Child Attachment", and "Acceptance of the Child") were all found to be very small in magnitude (see analysis of Total Direct and Indirect Effects). Some of these program impacts were also found to be in unexpected directions (i.e. a negative total effect was found where a net positive effect was expected).

Many of the Beta effects estimated in the structural equation models, were statistically significant across models. However over half of these "consistently significant" relationships among the eta, defy theoretical expectation (i.e. the directions of effect are again difficult to explain).

In the analyses of the Squared Multiple Correlations (R^2), it was evident that the models explain very little about the variance of the eta variables. This was likely due to the restricted use of ksi variables in the models i.e. the only independent variables used were "Length of Time in the Early Intervention Program", and "Child's Age at First Referral to the Early Intervention Program". While this was justifiable because of the program evaluation focus of the study, it resulted in a high level of conceptual modeling error due to the omission of other important variables. No one is prepared to claim for example, that the only mechanism by which "Parent-Child Attachment" increases is via the Early Intervention Program and its impact on "Positive Parenting Experiences". By keeping the models this simple however, a significant amount of modeling error was introduced. It is this conceptual modeling error that may be responsible for much of the inconsistency seen in the estimates of impact.

Use of over-simplified or possibly misspecified models, has resulted in relatively little information about the complex pathways by which the Early Intervention Program is effective. For example, in Model A1T the program showed a significant positive impact on parents' "Use of Informal Supports", but this did not lead to decreased "Social Isolation". Apparently there are other important intervening variables that have been missed in this section of the model. The literature and theory base supporting use of the concepts "Informal Supports" and "Social Isolation" is vast, yet unclear and unable to provide direction specific enough to enable correction and estimation of this model. The severe estimation problems with the A Models, means there is no valid information about program impact on parents' "Use of Informal Supports", "Avoidance / Passivity with Problems", and "Social Isolation".

Summary of Results and Findings

In the final analysis of the data, there are only three statements that can be made with any degree of confidence. First, the Early Intervention Program is performing at an impressive level with respect to: promoting positive psychological well-being; reducing family stress; helping parents reframe problems; and helping parents recognize the reinforcing behaviours in their child (Treatment Group families scored better over time in these areas, than did the Pre-Treatment and Control Group families).

Second, the Early Intervention Program is not 100% effective in preventing or counteracting Treatment Group parents' perceptions of child demandingness, but precisely how ineffective they are with this outcome cannot be determined because of limitations in the control and comparison groups.

Finally, the Early Intervention Program appears to have a net neutral impact (i.e. sometimes mildly positive and sometimes mildly negative) on several other important outcome variables, but faulty research design and poor causal modeling may be partially responsible for this finding.

CHAPTER V: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Overview of the Study

In summary, this study utilized a longitudinal non-equivalent control group design, to investigate the magnitude and mechanisms of impact from the Calgary Health Services Early Intervention Program, on family stress and coping with a young handicapped child. This was not a comprehensive program evaluation, although there were attempts to provide both formative and summative evaluation feedback to the program.

The investigation involved three waves of data collection (via mail), over the 1990 program year, i.e. February, July, and November. The Family Stress and Coping Questionnaire used in this study, was an adaptation of four well-established instruments, and was designed especially for this program evaluation.

The Treatment Group was comprised of 45 parents of children under 3 1/2 years of age with Down Syndrome or Developmental Delay, who were enrolled in the Early Intervention Program. The Pre-Treatment Group was comprised of 33 parents of children newly referred to the Early Intervention Program throughout the year. The Control Group was comprised of 78 parents of healthy children under the age of 3 1/2 years, sampled from the neighbourhood day care centers closest to the Treatment Group families. These sample sizes reflected an initial response rate of 70% for the Treatment Group, 34% for the Pre-Treatment Group, and 19% for the Control Group; there was significant drop-out over the one year data collection period.

The primary method of data analysis was structural equation modeling. Descriptive statistics and Pearson correlations were also utilized, mostly to establish the comparability of the three groups, and determine possible differential program impact. Qualitative data on parents' perceptions and satisfaction with the program, were analyzed by theme and content.

The causal models were specific to this program, hypothesized by the Early Intervention Program staff, and well supported by the literature. In total, 20 structural equation models of program impact were estimated with LISREL (the 21st model could not be estimated). All of the models had a non-significant Chi-square value and reasonable level of probability; Maximum Likelihood Estimation was used to arrive at the estimates of program impact, and the Standardized solution was presented for ease of interpretation. Nine models were disqualified in the final analysis, due to severe estimation problems.

The analyses revealed no evidence of differential program impact, either by parent or diagnostic subgroups. Significant program effects were found for six outcomes, i.e. increased length of time in the Early Intervention Program led to parents' increased positive psychological well-being; decreased use of formal supports; decreased family stress; increased ability to reframe problems; and increased perception of reinforcement from the child. There was also a significant program impact on parents' perception of child demandingness, but the direction of this effect was opposite to that intended (i.e. perception of child demandingness increased with time in the program). All other direct and indirect program effects failed to reach a statistically significant level. Limitations in the research design and causal modeling were identified and fully discussed.

Significance of the Study

The significance of this study is perhaps more practical than scientific. For the Calgary Health Services Early Intervention Program, it has provided some feedback regarding parent satisfaction, positive program effects, unintended program effects, and weak program effects. This study has likely contributed very little to the fields of social science research and early intervention, since the models used were simplistic and individualized to one program.

Structural equation modeling with LISREL is a promising alternative to the traditional evaluation methodologies currently utilized in health care. Many other programs and services share early intervention's problems of poor evaluability, i.e. because of their aims, structure, implementation, and outcomes, they are difficult or impossible to evaluate for impact and effectiveness. This study is one example of how structural equation modeling can be successfully applied, to a program that has a history of poor evaluation results because of difficulties in quantifying "soft" effects.

Recommendations

Results from this study should not be used in isolation to determine the longterm fate of the Early Intervention Program. This study focused exclusively on measuring effects on family stress and coping -- no other program outcomes were considered in the analysis, e.g. child's developmental progress.

There are few operational recommendations that can be made to the Early Intervention Program staff, based on the research results. They are performing admirably in at least five critical outcome areas. The obvious recommendation is to acknowledge and build on these areas of program strength, and seek ways to improve the unintended / neutral program impacts revealed in the analysis.

Although the use of non-equivalent control / comparison groups was a major limitation in this study, it is unrealistic to recommend replication with an equivalent control group. It is highly unlikely that Calgary or any other Canadian city, has an accessible group of families with young handicapped children receiving no health, education, or social support. It is also unlikely that new referrals to the Early

Intervention Program would agree to be randomized into treatment and non-treatment research groups. Even if this was feasible, there would be no way to control for the possible placebo effect of this program.

Replication of the study with a competing program would be possible and valuable, if the intent was to use the results for cost-utility analyses. Continued trial-and-error attempts at modeling program impact with different pathways and outcomes, is possible and potentially valuable provided the models have some theoretical basis. There are enough data, variables, and cases, to estimate an infinite number of possibly "better" program models. It is through such repeated rounds of hypothesizing, modeling, and testing, that new early intervention theories can be generated and substantiated.

REFERENCES

Aaronson, L.S., Frey, M.A., & Boyd, C.J. (1988). Structural equation models and nursing research: Part II. Nursing Research, 37(5), 315-318.

Abidin, R. (1986). The parenting stress index - manual. Charlottesville: Pediatric Psychology Press.

Anderson, J.C., & Gerbing, D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. Psychological Bulletin, 103(3), 411-423.

Austin, L., & Burns, J. (1985). Management science: An aid for managerial decision making. New York: MacMillan.

Bailey, D.B., & Simeonsson, R.J. (1988). Family assessment in early intervention. Columbus: Merrill.

Baskin, M., Levesque, L., MacPherson, A.S., Poole, P., & Sackett, D.L. (1980). Canada's health care evaluation seminars: An epilogue and evaluation. Canadian Journal of Public Health, 71(Sept./Oct.), 321-327.

Beckman, P.J. (1983). Influence of selected child characteristics on stress in families of handicapped infants. American Journal of Mental Deficiency, 88, 150-156.

Bentler, P.M., & Chou, C-P. (1987). Practical issues in structural modeling. Sociological methods and research, 16(1), 78-117.

Bentler, P.M. (1988). Causal modeling via structural equation systems. In J.R. Nesselroade & R.B. Cattell (Eds.). Handbook of multivariate experimental psychology (2nd ed.). New York: Plenum Press.

Beyer, J.M., & Trice, H.M. (1982). The utilization process: A conceptual framework and synthesis of empirical findings. Administrative Science Quarterly, 27(Dec.), 591-622.

Bickman, L., & Weatherford, D.L. (Eds.). (1986). Evaluating early intervention programs for severely handicapped children and their families. Austin: Pro-Ed.

Boncheh, L.I. (1979). Are randomized trials appropriate for evaluating new operations? The New England Journal of Medicine, 301(1), 44-45.

Boudreau, T.J., Last, J.M., Pocle, P.E., & Sackett, D. (1973). The national health grant health care evaluation seminars. Canadian Journal of Public Health, 64(May/June), 260-264.

Boyd, C.J., Frey, M.A., & Aaronson, L.S. (1988). Structural equation models and nursing research: Part I. Nursing Research, 37(4), 249-252.

Bradburn, N.M., & Caplovitz, D. (1965). Reports on happiness. Chicago: Aldine.

Bradburn, N.M. (1969). The structure of psychological well-being. Chicago: Aldine.

Breslau, N., Staruch, K.S., & Mortimer, E.A. (1982). Psychological distress in mothers of disabled children. American Journal of Disabled Children, 136, 682-686.

Breslow, L. (1989). Health status measurement in the evaluation of health promotion. Medical Care, 27(3), S205-S215.

Bricker, D.D. (1986). History and rationale for early intervention programs. In D.D. Bricker, Early education of at-risk and handicapped infants, toddlers, and preschool children. Glenview: Scott, Foresman, & Co.

Bricker, D.D. (1986). The impact of early intervention programs on children and families. In D.D. Bricker, Early education of at-risk and handicapped infants, toddlers, and preschool children. Glenview: Scott, Foresman, & Co.

Bricker, D., Carlson, L., & Schwarz, R. (1981). A discussion of early intervention for infants with Down Syndrome. Pediatrics, 67(1), 45-46.

Bricker, D., & Littman, D. (1982). Intervention and evaluation: The inseparable mix. Topics in Early Childhood Special Education, 1(4), 23-33.

Bricker, D., Sheehan, R., & Littman, D. (1981). Early intervention: A plan for evaluating program impact (U.S. Dept. of Education Report ED207277). Monmouth: Westar.

Bronfenbrenner, U. (1975). Is early intervention effective? In M. Guttentag & E.L. Struening (Eds.), Handbook of evaluation research (Vol.2). Beverly Hills: Sage.

Brook, R.H. (1979). Studies of process and outcome correlations in medical care evaluations. Medical Care, 17(8), 868-873.

Brook, R.H., Appel, F.A., Avery, C., Orman, M., & Stevenson, R.L. (1971). Effectiveness of inpatient follow-up care. New England Journal of Medicine, 285(27), 1509-1514.

Brook, R.H., Berg, M.H., & Schecter, P.A. (1973). Effectiveness of nonemergency care via an emergency room. Annals of Internal Medicine, 78(3), 333-339.

Brook, R.H., Davies-Avery, A., Greenfield, S., Harris, J., Lelah, T., Solomon, N.E., & Ware, J.E. (1977). Assessing the quality of medical care using outcome measures: An overview of the methods. Medical Care, 15(9), S1-S165.

Brook, R.H., & Lohr, K.N. (1985). Efficacy, effectiveness, variations, and quality. Medical Care, 23(5), 710-722.

Brook, R.H., & Stevenson, R.L. (1970). Effectiveness of patient care in an emergency room. New England Journal of Medicine, 283(17), 904-907.

Brynelsen, D., & Cummings, H. (1987). Infant development programs: Early intervention in delayed development. In C. Denholm, R. Ferguson, & A. Pence (Eds.), Professional child and youth care: The Canadian perspective. Vancouver: UBC Press.

Bunker, J.P., Fowles, J., & Schaffarzick, R. (1982). Evaluation of medical technology strategies: Effects of coverage and reimbursement. New England Journal of Medicine, 306(10), 620-624.

Bunker, J.P., Fowles, J., & Schaffarzick, R. (1982). Evaluation of medical technology strategies: Proposal for an institute for health care evaluation. New England Journal of Medicine, 306(11), 687-692.

Burdette, J.A., Babineau, R.A., Mayo, F., Hulka, B.S., & Cassel, J.C. (1974). Primary medical care evaluation -- The AAFP-UNC collaborative study. Journal of the American Medical Association, 230(12), 1668-1673.

Chance, G.W. (1988). Neonatal intensive care and cost effectiveness. Canadian Medical Association Journal, 139(10), 943-946.

Christie, D. (1979). Before-and-after comparisons: A cautionary tale. British Medical Journal, (Dec.22-29), 1629-1630.

Christoffel, T., & Loewenthal, M. (1977). Evaluating the quality of ambulatory health care: A review of emerging methods. Medical Care, 15(11), 877-897.

Cobb, S. (1976). Social support as a moderator of life stress. Psychosomatic Medicine, 38, 300-314.

Coulton, C.J. (1988). Evaluating screening and early intervention: A puzzle with many pieces. Social Work in Health Care, 13(3), 65-72.

Crnic, K.A., Greenberg, M.T., Ragozin, A.S., Robinson, N.M., & Basham, R.B. (1983). Effects of stress and social support on mothers of premature and full-term infants. Child Development, 54(1), 210-217.

Cubbon, J. (1987). Methods of evaluating community health services at the local level: Possible applications of routinely collected data. Community Medicine, 9(4), 323-330.

Custer, M. (1985). Stress, life events, and the epidemiology of wellness. Journal of Community Health Nursing, 2(4), 215-222.

Cuttance, P. (1987). Issues and problems in the application of structural equation models. In P. Cuttance & R. Ecob (Eds.), Structural modeling by example: Applications in educational, sociological, and behavioural research. New York: Cambridge University Press.

Davis, H.R., & Salasin, S.E. (1975). The utilization of evaluation. In E.L. Struening & M. Guttentag (Eds.), Handbook of evaluation research (Vol. 1). Beverly Hills: Sage.

Day, N.E., Williams, D.R., & Khaw, K.T. (1989). Breast cancer screening programs: The development of a monitoring and evaluation program. British Journal of Cancer, 59(6), 954-958.

Dicken, K.L., McKim, M.K., & Kirkland, J. (1983). Designing intervention programs for infants at risk: Considerations, implementation, and evaluation. Early Childhood Development and Care, 11(2), 45-164.

Donabedian, A. (1966). Evaluating the quality of medical care. Milbank Memorial Fund Quarterly: Part 2, 44(3), 166-206.

Donabedian, A. (1981). Advantages and limitations of explicit criteria for assessing the quality of health care. Milbank Memorial Fund Quarterly / Health and Society, 59(1), 99-106.

Donabedian, A. (1985). Twenty years of research on the quality of medical care: 1964-1984. Evaluation and the Health Professions, 8(3), 243-265.

Drummond, M.F., Stoddart, G.L., & Torrance, G.W. (1987). Methods for the economic evaluation of health care programmes. Toronto: Oxford University Press.

Duncan, O.D. (1975). Introduction to structural equation models. New York: Academic Press.

Dunst, C.J., Trivette, C.M., & Deal, A.G. (1988). Enabling and empowering families. Principles and guidelines for practice. Cambridge: Brookline.

Dunst, C.J., Trivette, C.M., Hamby, D., & Pollock, B. (1990). Family system correlates of the behavior of young children with handicaps. Journal of Early Intervention, 14(3), 204-218.

Dutton, D.B., & Silber, R.S. (1980). Children's health outcomes in six different ambulatory care delivery systems. Medical Care, 18(7), 693-714.

Eisen, M., Ware, J.E., Donald, C.A., & Brook, R.H. (1979). Measuring components of children's health status. Medical Care, 17(9), 902-921.

Entwisle, D.R., & Doering, S.G. (1981). The first birth -- a family turning point. Baltimore: Johns Hopkins University Press.

Fanshel, S., & Bush, J.W. (1970). A health-status index and its application to health-services outcomes. Operations Research, 18, 1021-1066.

Feeny, D.H., & Torrance, G.W. (1989). Incorporating utility-based quality-of-life assessment measures in clinical trials: Two examples. Medical Care, 27(3), S190-S204.

Ferry, P.C. (1981). On growing new neurons: Are early intervention programs effective? Pediatrics, 67(1), 38-41.

Fewell, R. (1986). The measurement of family functioning. In L. Bickman & D.L. Weatherford (Eds.), Early intervention programs for severely handicapped children and their families. Austin: Pro-Ed.

Fewell, R., & Vadasy, P. (Eds.). (1986). Families of handicapped children -- needs and supports across the lifespan. Austin: Pro-Ed.

Fineberg, H.V., & Hiatt, H.H. (1979). Evaluation of medical practices -- the case for technology assessment. New England Journal of Medicine, 301(20), 1086-1091.

Franklin, J.L., & Thrasher, J.H. (1976). An introduction to program evaluation. Toronto: John Wiley & Sons.

Friedrich, W.N. (1979). Predictors of the coping behaviours of mothers with handicapped children. Journal of Consulting and Clinical Psychology, 47, 1140-1145.

Gallagher, J.J., Cross, A.H., & Scharfman, W. (1981). Parental adaptation to a young handicapped child: The father's role. Journal of the Division for Early Childhood, 3, 3-14.

Garwood, S.G. (1982). Early childhood intervention: Is it time to change outcome variables? Topics in Early Childhood Special Education, 1(4), ix-xi.

Garwood, S.G. (1982). (Mis)Use of developmental scales in program evaluation. Topics in Early Childhood Special Education, 1(4), 35-49.

Gilson, B.S., Gilson, J., Bergner,M., Bobbitt, R.A., Kressel, S., Pollard, W.E., & Vesselago, M. (1975). The sickness impact profile -- development of an outcome measure in health care. American Journal of Public Health, 65(12), 1304-1310.

Gobel, H., & Kotsch, L.S. (1981). Extended families and young handicapped children. Topics in Early Childhood Special Education, 1, 29-35.

Gonnella, J.S., Goran, M.J., Williamson, J.W., & Cotsonas, N.J. (1970). Evaluation of patient care. Journal of the American Medical Association, 214(11), 2040-2043.

Gonnella, J.S., Hornbrook, M.C., & Louis, D.Z. (1984). Staging of disease -- a case-mix measurement. Journal of the American Medical Association, 251(5), 637-644.

Gonnella, J.S., Louis, D., & McCord, J.J. (1976). The staging concept -- an approach to the assessment of outcome of ambulatory care. Medical Care, 14(1), 13-22.

Goodwin, L.D., & Goodwin, W.L. (1984). Are validity and reliability "relevant" in qualitative evaluation research? Evaluation and the Health Professions, 7(4), 413-426.

Graham, K., & Birchmore-Timney, C. (1989). The problem of replicability in program evaluation -- the component solution using the example of case management. Evaluation and Program Planning, 12, 179-187.

Gray, S.W., & Wandersman, L.P. (1980). The methodology of home-based intervention studies: Problems and promising strategies. Child Development, 51(6), 993-1009.

Greenfield, S., Kaplan, S.H., Goldberg, G.A., Nadler, M.A., & Deigh-Hewertson, R. (1978). Physician preference for criteria mapping in medical care evaluation. Journal of Family Practice, 6(5), 1079-1086.

Greenfield, S., Lewis, C.E., Kaplan, S.K., & Davidson, M.B. (1975). Peer review by criteria mapping: Criteria for diabetes mellitus. Annals of Internal Medicine, 83(6), 761-770.

Guralnick, M.J., & Bennett, F.C. (Eds.). (1987). The effectiveness of early intervention for at-risk and handicapped children. Toronto: Academic Press.

Gurel, L. (1975). The human side of evaluating human service programs: Problems and prospects. In M. Guttentag & E.L. Struening (Eds.), Handbook of evaluation research (Vol. 2). Beverly Hills: Sage.

Guttentag, M., & Struening, E.L. (Eds.). (1975). Handbook of evaluation research (Vols. 1-2). Beverly Hills: Sage.

Guyatt, G., Drummond, M., Feeny, D., Haynes, R.B., & Tugwell, P. (1986). Guidelines for health technology assessment: Therapeutic technologies. In D. Feeny, G. Guyatt, & P. Tugwell (Eds.), Health care technology: Effectiveness, efficiency, and public policy. Montreal: Institute for Research on Public Policy.

Halpern, R. (1984). Lack of effects for home-based early intervention? Some possible explanations. American Journal of Orthopsychiatry, 54(1), 33-42.

Hanson, M.J., & Hanline, M.F. (1990). Parenting a child with a disability: A longitudinal study of parental stress and adaptation. Journal of Early Intervention, 14(3), 234-248.

Hanson, M.J., & Lynch, E.W. (1989). Early intervention -- implementing child and family services for infants and toddlers who are at-risk or disabled. Austin: Pro-Ed.

Hayduk, L.A. (1988). Structural equation modeling with LISREL -- essentials and advances. Baltimore: Johns Hopkins University Press.

Hellinger, F.J. (1989). Expected utility theory and risky choices with health outcomes. Medical Care, 27(3), 273-279.

Hennekins, C.H., & Buring, J.W. (1987). Epidemiology in medicine. Mayrent, S.L. (Ed.). Toronto: Little, Brown, & Co.

Herman, J.L., Morris, L.L., & Fitz-Gibbon, C.T. (1987). The program evaluation kit (Vols. 1-9). Newbury Park: Sage.

Higgins, C.W. (1986). Evaluating wellness programs. Health Values, 10(6), 44-51.

Hirschorn, N.H., Lamstein, J., Klein, S.F., McCormick, J., & Warner, T.N. (1978). Quality by objectives: A model of quality of care assessment and assurance for ambulatory health centers. Journal of Ambulatory Care Management, 1(Jan.), 55-73.

Honig, A.S. (1983). Evaluation of infant/toddler intervention programs. Studies in Educational Evaluation, 8, 305-316.

Jöreskog, K.G., & Sörbom, D. (1989). LISREL 7 user's reference guide (1st ed.). Mooresville: Scientific Software.

Kane, R.L., Gardner, J., Wright, D.D., Snell, G., Sundwall, D., & Woolley, R. (1977). Relationship between process and outcome in ambulatory care. Medical Care, 15(11), 961-966.

Kaplan, R.M., & Bush, J.W. (1982). Health-related quality of life measurement for evaluation research and policy analysis. Health Psychology, 1(1), 61-80.

Kazak, A.E., & Marvin, R.S. (1984). Differences, difficulties, and adaptation: Stress and social networks in families with a handicapped child. Family Relations, 33, 67-77.

Kessner, D.M., Kalk, C.E., & Singer, J. (1973). Assessing health quality -- the case for tracers. New England Journal of Medicine, 288(4), 189-194.

Kiresuk, T.J., & Sherman, R.E. (1968). Goal attainment scaling: A general method for evaluating comprehensive community mental health programs. Community Mental Health Journal, 4(6), 443-453.

Lazarus, R.S. (1985). The psychology of stress and coping. Issues in Mental Health Nursing, 1(4), 399-418.

Lebow, J. (1974). Consumer assessments of the quality of medical care. Medical Care, 12(4), 328-337.

Lebow, J. (1983). Similarities and differences between mental health and health care evaluation studies. Evaluation and Program Planning, 6, 237-245.

Leib, S.A., Benfield, G., & Guidubaldi, J. (1980). Effects of early intervention and stimulation on the preterm infant. Pediatrics, 66(1), 83-90.

Lerner, M. (1977). The non-health services determinants of health levels. Medical Care, 15(5), S74-S83.

Levin, H.M. (1975). Cost-effectiveness analysis in evaluation research. In M. Guttentag & E.L. Struening (Eds.), Handbook of evaluation research (Vol.2). Beverly Hills: Sage.

Lieberman, H.M. (1974). Evaluating the quality of ambulatory pediatric care at a neighbourhood health center -- creative use of chart review. Clinical Pediatrics, 13(1), 52-55.

Lohr, K.N. (1988). Outcome measurement: Concepts and questions. Inquiry, 25, 37-50.

Mahoney, G., O'Sullivan, P., & Dennebaum, J. (1990). A national study of mothers' perceptions of family focused early intervention. _Journal of Early Intervention_, _14_(2), 133-146.

Maisto, A.A., & German, M.L. (1979). Variables related to progress in a parent-infant training program for high-risk infants. _Journal of Pediatric Psychology_, _4_(4), 409-419.

Marfo, K., & Kysela, G.M. (1985). Early intervention with mentally handicapped children: A critical appraisal of applied research. _Journal of Pediatric Psychology_, _10_(3), 305-324.

Mates, S., & Sidel, V.W. (1981). Quality assessment by process and outcomes methods: Evaluation of emergency room care of asthmatic adults. _American Journal of Public Health_, _71_(7), 687-693.

McAuliffe, W.E. (1978). Studies of process-outcome correlations in medical care evaluations: A critique. _Medical Care_, _16_(11), 907-930.

McAuliffe, W.E. (1979). Measuring the quality of medical care: Process versus outcome. _Milbank Memorial Fund Quarterly / Health and Society_, _57_(1), 118-152.

McCord, J., Cattani, J., & Louis, D. (1976). _The staging methodology: A system for analyzing the quality, outcome, and cost of medical care_. Santa Barbara: Systematrics.

McCubbin, H.I., Cauble, A.E., & Patterson, J.M. (1982). _Family stress, coping, and social support_. Springfield: Thomas.

McCubbin, H.I., Olson, D.H., & Larsen, A.S. (1981). The family crises oriented personal scales: F-COPES. In H.I. McCubbin & J. Patterson (Eds.), _Systematic assessment of family stress, resources, and coping -- tools for research, education, and clinical intervention_. St. Paul: University of Minnesota.

McCubbin, H.I., & Patterson, J. (1981). The family inventory of resources for management: FIRM. In H.I. McCubbin & J. Patterson (Eds.), Systematic assessment of family stress, resources, and coping -- tools for research, education, and clinical intervention. St. Paul: University of Minnesota.

McCubbin, M.A. (1989). Family stress and family strengths: A comparison of single and two-parent families with handicapped children. Research in Nursing and Health, 12, 101-110.

McKinney, B. & Peterson, R. (1987). Predictors of stress in parents of developmentally disabled children. Journal of Pediatric Psychology, 12, 133-149.

McLinden, S.E. (1990). Mothers' and fathers' reports of the effects of a young child with special needs on the family. Journal of Early Intervention, 14(3), 249-259.

Mushlin, A.I., & Appel, F.A. (1980). Testing an outcome based quality assurance strategy in primary care. Medical Care, 18(5), S1-S100.

Novick, L.F., Dickinson, K., Asnes,R., Maylan, S.P., & Lowenstein, R. (1976). Assessment of ambulatory care: Application of the trace methodology. Medical Care, 14(1), 1-12.

Osborne, C.E., & Thompson, H.C. (1975). Criteria for evaluation of ambulatory child health care by chart audit: Development and testing of a methodology. Pediatrics, 56(4), 625-649.

Palmer, R.H. (1983). Ambulatory health care evaluation: Principles and practice. Chicago: American Hospital Publishing.

Palmer, R.H., & Nesson, H.R. (1982). A review of methods for ambulatory medical care evaluations. Medical Care, 20(8), 758-781.

Pascoe, G.C., & Attkisson, C.C. (1983). The evaluation ranking scale: A new methodology for assessing satisfaction. Evaluation and Program Planning, 6, 335-347.

Peterson, N.L. (1987). The rationale for early intervention. In N.L. Peterson, Early intervention for handicapped and at-risk children. Denver: Love.

Peterson, P. (1984). Effects of moderator variables in reducing stress outcome in mothers of children with handicaps. Journal of Psychosomatic Research, 28, 337-344.

Pillemer, D.B., & Light, R.J. (1980). Synthesizing outcomes: How to use research evidence from many studies. Harvard Educational Review, 50(2), 176-195.

Poland, O.F. (Ed.). (1974). A symposium: Program evaluation. Public Administration Review, 34(July-Aug.), 299-338.

Powell, D.R. (1982). From child to parent: Changing conceptions of early childhood intervention. Annals of the American Academy of Political and Social Science, 461, 135-144.

Ramey, C.T., Campbell, F.A., & Wasik, B.H. (1982). Use of standardized tests to evaluate early special education programs. Topics in Early Childhood Special Education, 1(4), 51-60.

Relman, A.S. (1980). Assessment of medical practices. New England Journal of Medicine, 303(3), 153-154.

Relman, A.S. (1982). An institute for health care evaluation. New England Journal of Medicine, 11(306), 669-670.

Rennebohm, H., & O'Brien, N. (1989). Program-based quality assurance: A reconciliation of quality assurance and program evaluation. Healthcare Management Forum, 2(1), 32-35.

Rhoads, G.G. (1986). Use of case-control studies for the evaluation of preventive health care. Journal of Ambulatory Care Management, 9(4), 53-64.

Roberts, R.N., & Wasik, B.H. (1990). Home visiting programs for families with children birth to three: Results of a national survey. Journal of Early Intervention, 14(2), 133-146.

Rog, D.J., & Bickman, L. (1984). The feedback research approach to evaluation: A method to increase evaluation utility. Evaluation and Program Planning, 7, 169-175.

Romm, F.J., & Hulka, B.S. (1979). Developing criteria for quality of care assessment: Effect of the Delphi technique. Health Services Research, 14, 309-312.

Romm, F.J., Hulka, B.S., & Mayo, F. (1976). Correlates of outcomes in patients with congestive heart failure. Medical Care, 14(9), 765-776.

Rooks, J.P., Weatherby, N.L., Ernst, E.K.M., Stapelton, S., Rosen, D., & Rosenfield, A. (1989). Outcomes of care in birth centers -- the national birth center study. New England Journal of Medicine, 321(26), 1804-1811.

Roos, L.L., Nicol, P., Cageorge, S.M. (1987). Using administrative data for longitudinal research: Comparisons with primary data collection. Journal of Chronic Diseases, 40(1), 41-49.

Rossi, P.H., & Freeman, H.E. (1985). Evaluation -- a systematic approach (3rd ed.). Beverly Hills: Sage.

Rubenstein, L., Mates, S., & Sidel, V.W. (1977). Quality-of-care assessment by process and outcome scoring -- use of weighted algorithmic assessment criteria for evaluation of emergency room care of women with symptoms of urinary tract infection. Annals of Internal Medicine, 86(5), 617-625.

Russell, I.T., Devlin, H.B., Fell, M., Glass, N.J., & Newell, D.J. (1977). Day-case surgery for hernias and haemorrhoids. The Lancet, (Apr.16), 844-847.

Sackett, D.L., Chambers, L.W., MacPherson, A.S., Psych, D., Goldsmith, C.H., & McAuley, R.G. (1977). The development and application of indices of health: General methods and a summary of results. American Journal of Public Health, 67(5), 423-428.

Sackett, D.L., Spitzer, W.O., Gent, M., & Roberts, R.S. (1974). The Burlington randomized trial of the nurse practitioner: Health outcomes of patients. Annals of Internal Medicine, 80(2), 137-142.

Sanderson, C., Svanstrom, L., & Eriksson, C.G. (1988). Development of strategies for evaluating a community intervention programme for cancer prevention through dietary change. Community Medicine, 10(4), 289-297.

Schach, E., & Starfield, B. (1973). Acute disability in childhood: Examination of agreement between various measures. Medical Care, 11(4), 297-309.

Seligman, M., & Darling, R.B. (1989). Ordinary families, special children -- a systems approach to childhood disability. New York: Guilford Press.

Sheehan, R. (1981). Issues in documenting early intervention with infants and parents. Topics in Early Childhood Special Education, 1(3), 67-75.

Sheehan, R., & Keogh, B.K. (1982). Design and analysis in the evaluation of early childhood special education programs. Topics in Early Childhood Special Education, 1(4), 81-88.

Shortell, S.M., & Richardson, W.C. (1978). Health program evaluation. St. Louis: Mosby.

Simeonsson, R.J., Cooper, D.H., & Scheiner, A.P. (1982). A review and analysis of the effectiveness of early intervention programs. Pediatrics, 69(5), 635-641.

Simeonsson, R.J., Huntington, G.S., & Short, R.J. (1982). Individual differences and goals: An approach to the evaluation of child progress. Topics in Early Childhood Special Education, 1(4), 71-80.

Singer, G., & Irvin, L. (Eds.). (1989). Support for caregiving families: Enabling adaptation to disability. Baltimore: Brooks.

Sjoberg, G. (1975). Politics, ethics, and evaluation research. In M. Guttentag & E.L. Struening (Eds.), Handbook of evaluation research (Vol.2). Beverly Hills: Sage.

Soboloff, H.R. (1981). Early intervention -- fact or fiction. Developmental Medicine and Child Neurology, 23(2), 261-266.

Starfield, B. (1974). Measurement of outcome: A proposed scheme. Milbank Memorial Fund Quarterly / Health and Society, 52(Winter), 39-50.

Starfield, B., & Scheff, D. (1972). Effectiveness of pediatric care: The relationship between process and outcome. Pediatrics, 49(4), 547-552.

Strasser, S., Steinberg, J.S., Cummins, G., & Persels, J. (1983). Why some evaluation studies are useful and others not: Facilitators and obstacles to the use of evaluation research in hospital settings. Hospital and Health Services Administration, (Jan./Feb.), 69-95.

Suchman, E.A. (1967). Evaluative research: Principles and practice in public service and social action programs. New York: Russell Sage Foundation.

Summers, J.A., Behr, S.K., & Turnbull, A.P. (1989). Positive adaptation and coping strengths of families who have children with disabilities. In G. Singer & L. Irvin (Eds.), Support for caregiving families: Enabling adaptation to disability. Baltimore: Brooks.

Takanishi, R., & Feshbach, N.D. (1982). Early childhood special education programs, evaluation, and social policies. Topics in Early Childhood Special Education, 1(4), 1-9.

Thompson, H.C., & Osborne, C.E. (1974). Development of criteria for quality assurance of ambulatory child health care. Medical Care, 12(10), 807-826.

Thompson, H.C., & Osborne, C.E. (1976). Quality assurance of ambulatory child health care -- opinions of practicing physicians about proposed criteria. Medical Care, 14(1), 22-38.

Tingey, C. (1989). Evaluation of effectiveness. In C. Tingey (Ed.), Implementing early intervention. Baltimore: Brooks.

Tornatzky, L.G., & Johnson, E.C. (1982). Research on implementation: Implications for evaluation practice and evaluation policy. Evaluation and Program Planning, 5, 193-198.

Torrance, G.W., Thomas, W.H., & Sackett, D.L. (1972). A utility maximization model for evaluation of health care programs. Health Services Research, 7(Summer), 118-133.

Tugwell, P., Bennett, K.J., Sackett, D.L., & Haynes, R.B. (1985). The measurement iterative loop: A framework for the critical appraisal of need, benefits, and costs of health interventions. Journal of Chronic Diseases, 38(4), 339-351.

Twain, D. (1975). Developing and implementing a research strategy. In E.L. Struening & M. Guttentag (Eds.), Handbook of evaluation research (Vol.1). Beverly Hills: Sage.

Tymstra, Tj., Heyink, J.W., Roorda, J., Bijleveld, C.M.A., Gips, C.H., & Slooff, M.J.H. (1988). Research into quality of life: A qualitative approach in the evaluation of a liver transplant programme. Health Policy, 10, 231-240.

Veney, J.E., & Kaluzny, A.D. (1984). Evaluation and decision making for health services programs. Englewood Cliffs: Prentice-Hall.

Wagner, E.H., Greenberg, R.A., Imrey, P.B., Williams, C.A., Wolf, S.H., & Ibrahim, M.A. (1976). Influence of training and experience on selecting criteria to evaluate medical care. New England Journal of Medicine, 294(16), 871-876.

Wagner, E.H., & Guild, P.A. (1989). Choosing an evaluation strategy. American Journal of Health Promotion, 4(2), 134-140.

Wales, J., Kane, R., Robbins, S., Bernstein, L., & Krasnow, R. (1983). UCLA Hospice evaluation study -- methodology and instrumentation. Medical Care, 21(7), 734-744.

Wang, M.C., & Ellett, C.D. (1982). Program validation: The state of the art. Topics in Early Childhood Special Education, 1(4), 35-49.

Ware, J.E., Snyder, M.K., Wright, R., & Davies, A.R. (1983). Defining and measuring patient satisfaction with medical care. Evaluation and Program Planning, 6, 247-263.

Weikel, K., Yordy, K.D., Goldman, L. (1971). Evaluation of national health programs. American Journal of Public Health, 61(9), 1801-1811.

Weiss, C. (1972). Evaluation research: Methods for assessing program effectiveness. Englewood Cliffs: Prentice-Hall.

Weiss, C. (1975). Evaluation research in the political context. In E.L. Struening & M. Guttentag (Eds.), Handbook of evaluation research (Vol.1). Beverly Hills: Sage.

White, K.R., & Casto, G. (1989). What is known about early intervention? In C. Tingey (Ed.), Implementing early intervention. Baltimore: Brookes.

Wilfong, E., & Abidin, R. (1986). Parenting stress and its relationship to child and maternal health. University of Virginia: Institute of Clinical Psychology.

Williamson, J.W. (1971). Evaluating quality of patient care: A strategy relating outcome and process assessment. Journal of the American Medical Association, 218(4), 564-569.

Williamson, J.W. (1978). Assessing and improving health care outcomes: The health accounting approach to quality assurance. Cambridge: Ballinger.

Williamson, J.W., Aronovitch, S., Simonson, L., Ramirez, C., & Kelly, D. (1975). Health accounting -- an outcome-based system of quality assurance: Illustrative application to hypertension. Bulletin of the New York Academy of Medicine, 51(6), 727-738.

Wortman, P.M. (Ed.). (1981). Methods for evaluating health services. Beverly Hills: Sage.

Zigler, E., & Balla, D. (1982). Selecting outcome variables in evaluations of early childhood special education programs. Topics in Early Childhood Special Education, 1(4), 11-22.

Zigler, E., & Berman, W. (1983). Discerning the future of early childhood intervention. American Psychologist, (Aug.), 894-906.

Zuckerman, H.S., Huntley, J.A., & Waterbrook, K.J. (1980). Effectiveness of patient care in a primary care clinic. Medical Care, 18(10), 1001-1012.

BIBLIOGRAPHY

American Psychological Association. (1983). _Publication manual of the American Psychological Association_ (3rd ed.). Washington: Author.

Campbell, D.T., & Stanley, J.C. (1963). _Experimental and quasi-experimental designs for research_. Boston: Houghton Mifflin

Gravetter, F.J., & Wallnau, L.B. (1988). _Statistics for the behavioral sciences -- a first course for students of psychology and education_ (2nd ed.). St. Paul: West.

Isaac, S., & Michael, W.B. (1981). _Handbook in research and evaluation_ (2nd ed.). San Diego: Edits.

Kachigan, S.K. (1986). _Statistical analysis -- an interdisciplinary introduction to univariate and multivariate methods_. New York: Radius Press.

LoBiondo-Wood, G., & Haber, J. (1986). _Nursing research -- critical appraisal and utilization_. St. Louis: Mosby.

Polit, D.F., & Hungler, B.P. (1987). _Nursing research: Principles and methods_ (3rd ed.). New York: Lippincott.

SPSS Inc. (1984). _Userproc LISREL: using LISREL VI within SPSSX_. Chicago: Author.

SPSS Inc. (1988). _SPSS/PC+ V2.0 base manual for the IBM PC/XT/AT and PS/2_. Chicago: Author.

Strunk, W., & White, E.B. (1979). _The elements of style_ (3rd ed.). New York: MacMillan.

University of Alberta. (1989). _Regulations and guide for the preparation of theses_ (rev. ed.). Edmonton: Faculty of Graduate Studies and Research.

Wilson, H.S. (1985). _Research in nursing_. Menlo Park: Addison-Wesley.

Woodward, C., & Chambers, L. (1983). _A guide to questionnaire construction and question writing_. Ottawa: Canadian Public Health Association.

Appendix I

Description of the Early Intervention Program

Philosophy

Calgary's Early Intevention Program (hereafter called E.I.P.) is guided by the philosophical position outlined for the larger provincial program. As of March 1989 there are nine statements of belief:

1. All children with developmental delays should be viewed as children first.

2. The opportunity of learning through play experiences is essential to all children, including those with developmental delays.

3. All children, regardless of the severity of their disability, have the potential to benefit from carefully selected developmental activities.

4. E.I.P. staff should work in partnership with families to foster their continued growth and independence.

5. E.I.P. staff should help families identify and use their informal support networks.

6. Families who have young children with developmental delays have, or can acquire, the skills necessary to become capable of enhancing the development of their children and provide a nurturing family environment.

7. Families of young children with developmental delays should be given the opportunity to learn what they can do to help their child's early development and the resources available to them.

8. Families of young children with developmental delays have the right and responsibility to be actively involved in all decisions affecting their children and their family situations.

9. Families should be encouraged to become effective consumers of services and advocates for their children.

Purposes

The E.I.P. has identified five purposes:

1. To assist families with a developmentally delayed child to adjust and to mobilize their own resources.

2. To assist families to learn about child development and how to provide activities and opportunities which are designed to maximize their child's potential.

3. To provide opportunities for families and their children to participate in learning experiences in group situations.

4. To provide families of developmentally delayed children with information about the continuum of service alternatives available to them.

5. To assist families with developmentally delayed children in developing their skills, to advocate for, assess and work with community resources and services as needed.

Administration

There are three full-time staff in the Calgary program each with a degree related to child development (e.g. psychology, special education), and extensive prior experience with special needs children and multi-problem families. One staff member functions as the Program Coordinator accountable to the Associate Director of Nursing for Calgary Health Services. There is one Provincial Consultant at Alberta Health who is responsible for this and the thirteen other community programs (from 1975-1983 E.I.P. was under Social Services). The E.I.P. in Calgary has an annual budget of $132,641 (1990-91) to cover salaries, travel and expenses, staff development, supplies, and general administration costs.

Criteria for Admission

Any child under 3 1/2 years of age with a documented delay in development (e.g. speech and language, gross motor, fine motor, cognitive, social, etc.) may be referred to the program. Parents may self-refer or more often, a community health nurse or physician will initiate the contact on behalf of the family. At this time the program is unable to accept children at-risk for delay / handicap (due to predisposing biological or social conditions) because of budget restrictions -- a problem needs to have occurred before a child is eligible.

The underlying cause of the delay may or may not be known e.g. Down Syndrome, Cerebral Palsy, blindness, and deafness are all known causes of delayed development, but in many cases the etiology is not clear. The staff recommend early referral as soon as a problem is detected; they feel the program is most effective if the child is very young and the delay has been recently diagnosed (e.g. about 18 infants per year are "born" into the program because they have Down Syndrome, which is readily detected prior to or soon after birth). Most referrals to the E.I.P. (70%) are made when the child fails to meet the developmental milestones in the first year of life.

During the 1990 program year Calgary's E.I.P. received 139 new referrals; 38% originated with the community health nurses, 32% came from physicians and hospitals, and 27% were self-referrals from concerned parents. Of the 139 new referrals only 56 were accepted into the program after the initial interview and assessment. There was an 80% increase in new program referrals from 1989 to 1990 (there were only 77 new referrals made in 1989). This dramatic increase was thought to be due to a change in policy whereby community health nurses no longer perform the Denver Developmental Screening Test on children suspected of delay. There were a total of 104 families (48 pre-existing) on the active caseload for the 1990 program year. Approximately 40% of the families in the program had a child with Down Syndrome; the others had a child with developmental delay due to other causes. At the end of 1990 the Calgary program had a waiting list of seven, and the E.I.P. was exceeding the provincial guidelines for families per staff member.

Reasons for Non-Admission

Of the 83 families newly referred but not admitted to the program: 47% of children demonstrated no significant developmental delay at the time of referral; 22% of parents chose not to participate after learning more about the program; and 12% were denied access because the child was already involved in a similar program. The remaining 19% of non-admissions were for a variety of reasons, e.g. staff unable to locate family, child died, family required consultation only, family moved/lived outside program area, or child exceeded age criteria.

Criteria for Discharge

Parents may discontinue the service at any time but this happens infrequently except for relocation (similarly families who have been in E.I.P. prior to moving to Calgary are usually referred). When the child approaches 3 years of age the staff initiate a gradual process of disengagement, so the family is ready to move into the group-based programs offered by the community.

Families may also be discharged from the program if it is felt there is a duplication of services (e.g. Infant Therapy Program at the Alberta Children's Hospital). This also happens rarely despite the variety of services available to families of handicapped children. The E.I.P. claims to fulfill a unique role in the community because they are home-based, allow a high degree of parental choice and control, and provide practical suggestions suited to the daily activities of a family. One of their functions is to help families understand and connect with other community services, but this does not necessarily mean the E.I.P. service will be discontinued.

Other programs available in Calgary include: Ups & Downs (parent support group); Hanen Speech Classes; PREP (preschool readiness program); PCDC (Providence Child Day Care -- a special needs day care); Moms & Tots (for Down Syndrome); Observation Nursery (to meet parents with children of similar age); Mobile Team (for follow-up of special needs children in an integrated day care); QUEST (for children 2 1/2 years or older with multiple handicaps); Calgary Association for the Mentally Handicapped (for respite care); HCS (Handicapped Childrens' Services for financial assistance with a handicapped child); Technical Resource Centre (for technical aids to learning and development); SCOPE (for children with developmental handicap and / or behavioural and emotional problems); PALS and PACEE (for language stimulation); and several specialized follow-up clinics at Alberta Children's Hospital DAT Center (e.g. Down Syndrome Follow-up, Developmental Clinic, Genetics Clinic, Neurology Clinic, Perinatal Follow-up, etc.).

During the 1990 program year there were 65 discharges from the Calgary E.I.P.: 58% due to child's transfer to another program; 14% because the developmental delay had resolved; 12% because parents chose to discontinue; and the remaining 16% due to relocation, death, or adoption.

Implementation of the Program

Once a child has been referred and accepted into the program, a detailed developmental and family assessment is conducted. Short-range developmental goals are set, and home visits occur approximately bi-weekly to monitor progress and revise the plan. Frequently the program staff loan appropriate toys and reading material for the parents to use.

The appointment for the home-visit is always made in conjunction with the family -- it can occur in the evening to accomodate working parents. Parents receive a copy of all notes and plans made for their child. As much as possible the staff try to respond to the specific concerns identified by the parents. The content and structure of the home-visit is very flexible, and appears to be approximately 2/3 related to child development and 1/3 related to family life issues. There is some variation among staff members in the conduct and focus of the home-visits, due to differences in their caseload and philosophical priorities.

From the staff's perspective "an easy family" is one that acknowledges their child has a problem, and is able / willing to provide a supportive environment. Usually families of children with Down Syndrome are "easy" families, since the diagnosis and etiology are clear. A "difficult family" is one that either denies a serious problem, or has so many other problems that a handicapped child is a low priority for attention. Often the "difficult" families are those with children who have developmental delay for unknown reasons. After a period of time if a "difficult" family sees no need for the E.I.P., follow-up is reduced or discontinued, or the family is referred to another department (e.g. community health nursing).

The strongest advocates for Calgary's E.I.P. are the parents and the community health nurses. There is only one opponent that can be identified, a physician who has apparently made a variety of complaints about the program, e.g. the stimulation is too aggressive for the weaker infants, the families have too many professionals already involved, the program monies would be better invested in other areas.

In the opinion of the E.I.P. staff, children with diagnosed handicaps have high-quality services and resources available in the city of Calgary. They suspect there are many children with undiagnosed developmental problems who "fall through the cracks of the system". Many families in this program are very knowledgeable, articulate, and function well with a high degree of choice and autonomy. Parents who are less confident in becoming involved with a community program are not as likely to continue with the home visits. For these reasons the E.I.P. staff are concerned they may be dealing with a segment of the population with the "least need". If this is truly the situation, progress as a result of program intervention will be especially difficult to detect and measure.

Implicit Causal Hypotheses

Two mothers were asked, "What do you find helpful about E.I.P.?" The theme of their responses was similar, "I need to know I'm doing everything possible to help my child". The program appeared to be a source of reassurance for these two parents of children with Down Syndrome.

Each of the program staff were asked, "What is your theory about how E.I.P. works for families?" One staff member responded, "When parents learn about stimulation techniques and child development, they begin to have more realistic expectations for the child and their stress and frustration is therefore reduced". A second staff member replied, "My role with families is primarily to provide support. I want parents to have positive feelings and experiences associated with this child. If parents feel good about themselves and their lives in general, a special needs child will be better accepted and treated". The third staff person theorized that E.I.P. "helps families mobilize their resources and develop coping abilities, so they can respond to the needs and extra demands of a child with a handicap".

The E.I.P. staff identified several issues associated with raising a special needs child, which they hoped their program helped resolve: guilt about the child; worry about the child's future; too much to do and not enough time; fatigue; needing to be assertive yet not wanting to annoy professionals on whom they relied; family disagreements on limit-setting and discipline; problems with siblings and partner.

The staff acknowledged the program itself could be an additional stressor for parents: if they feel badly about missing appointments or not implementing the stimulation plan; if they feel control and authority for the child is being taken from them; or conversely if they feel pressured by the message "your child's development all depends on you".

Program Evaluation

While there is ongoing monitoring of operational activities for quality assurance purposes, there have been no comprehensive evaluations conducted on this program. To properly conduct an evaluation of impact or effect on the children, siblings, parents, extended family, staff, and other community programs, a large randomized experimental study would be required. Since either a comprehensive evaluation or randomized trial are beyond the scope of resources available (i.e. time, money, and expertise), it was agreed this evaluation effort should focus on testing the implicit causal models and measuring the impact of the program on family stress and coping with the child.

Appendix II

Family Stress and Coping Questionnaire -- Program Groups

FAMILY STRESS AND COPING QUESTIONNAIRE

PART I

PLEASE ANSWER ALL PARTS OF THIS QUESTIONNAIRE AS COMPLETELY AND HONESTLY AS POSSIBLE — THERE ARE NO RIGHT OR WRONG ANSWERS.
WHEN ANSWERING THE QUESTIONS PLEASE THINK ABOUT YOUR CHILD WHO IS ENROLLED IN THE EARLY INTERVENTION PROGRAM.
ONE QUESTIONNAIRE PER PARENT PLEASE — IF BOTH PARENTS ARE RESPONDING PLEASE COMPLETE SEPARATE QUESTIONNAIRES.
ALL THE INFORMATION YOU PROVIDE WILL BE USED FOR RESEARCH PURPOSES ONLY AND WILL BE KEPT STRICTLY CONFIDENTIAL.

Study #: ________/________/________ This Questionnaire Was Completed On: ______ (Day) ______ (Month) ______ (Year)

Age of Child: ___ Under 1 Month ___ 13-18 Months (1-1½ Years) ___ 31-36 Months (2½-3 Years) Sex of Child: ___ Female
___ 1-6 Months ___ 19-24 Months (1½-2 Years) ___ 37-42 Months (3-3½ Years) ___ Male
___ 7-12 Months ___ 25-30 Months (2-2½ Years) ___ 42-48 Months (3½-4 Years)

Your Relationship to This Child: ___ Mother ___ Father ___ Foster-Mother ___ Foster-Father ______________ Other (specify)

Who Usually Cares for This Child During the Day? __ Parent or Foster-Parent __ Relative __ Babysitter __ Daycare / Preschool
__ Other (please specify) ______________________________

How Many Other Children Under the Age of 6 Years Are in Your Home (please provide their ages)? ______________________

Do You Think Your Child Has a Serious Handicap, Health Problem, or Behaviour Problem? ____ Yes ____ No ____ Not Sure

Your Marital Status: ___ Married ___ Single ___ Living with Male / Female Friend ___ Separated ___ Divorced ___ Widowed

Your Present Age: ___ Under 18 years ___ 18-23 years ___ 24-29 years ___ 30-40 years ___ 40-50 years ___ Over 50 years

Ethnicity / Culture of Your Family: ___ White ___ North American Indian ___ Asian/Oriental ___ East Indian ___ African
___ Other (please specify) ______________________________

Religion: ______________________ Is Religion an Important Part of Your Family Life? ___ Yes ___ No ___ Somewhat

Education (please indicate your highest level achieved): __ Elementary or Grade School __ Some High School __ High School Diploma
__ Some College or University __ College Diploma __ University Degree

Employment (please indicate your current status): ___ Full-time ___ Part-time ___ Homemaker ___ Unemployed ___ Student

-OVER-

PART II

How often do each of these following statements describe your current situation.	ALMOST NEVER	ONCE IN AWHILE	SOMETIMES	FREQUENTLY	ALMOST ALWAYS
1. Our family is under a lot of emotional stress					
2. We feel we don't have enough control over the direction our lives are taking					
3. Certain adult members of our family do all the giving while others do all the taking					
4. When we need something that can't be postponed we have enough money to cover it					
5. When we face problems or difficulties in our family, we:					
(a) Know that we have the strength within our own family to solve our problems					
(b) Accept stressful events as a fact of life					
(c) Escape by watching television					
(d) Rely on God to help us					
(e) Have a few drinks					
(f) Share our troubles with relatives, friends, or neighbours					
(g) Seek professional counseling and help for family difficulties					
6. How often did you feel this way during the past few weeks?					
(a) Pleased about having accomplished something					
(b) Particularly excited or interested in something					
(c) So restless that you couldn't sit long in a chair					
(d) Upset because someone criticized you					

PART III

To what extent do each of these following statements describe your current feelings.	STRONGLY DISAGREE	DISAGREE	NOT SURE	AGREE	STRONGLY AGREE
1. Physically I feel good most of the time					
2. When I do things for my child I get the feeling he/she appreciates my efforts					
3. My child does a few things which bother me a great deal					
4. This child seems to be much harder to care for than most children					
5. I enjoy being a parent to this child					
6. This child is more attached to me than to other people					
7. I give up more of my life to meet this child's needs than I thought I would have to					
8. I usually feel guilty about the way I feel towards my child					
9. Having this child has caused more problems than I expected in my relationship with with my partner					
10. When I run into a problem taking care of this child, I have enough people to whom I can talk to get help or advice					

PLEASE CONTINUE WITH PART IV.

PART IV

PLEASE COMPLETE THIS SECTION IF YOUR CHILD IS ENROLLED IN THE EARLY INTERVENTION PROGRAM THROUGH CALGARY HEALTH SERVICES. THERE IS ADDITIONAL SPACE ON THE BACK OF THIS FORM IF REQUIRED.

Age Of Your Child When First Enrolled In The Early Intervention Program: ________ Months

Total Length Of Time Your Child Has Been In The Early Intervention Program: ________ Months, Or ___ We Are Just Starting The Program

Where Did You First Hear About The Early Intervention Program? ____________________

Why Has Your Child Been Referred To / Followed By The Early Intervention Program? ____________________

What Other Special Services, Programs, Or Agencies Are Currently Involved For Your Child And Family? ____________________

What Do You Find (Or Hope To Find) Helpful About The Early Intervention Program? ____________________

Do You Have Any Suggestions For Improving The Services Offered By The Early Intervention Program? ____________________

What Changes (If Any) Have You Seen In Your Child, Yourself, And Your Family Since Enrolling In The Early Intervention Program?

Overall How Do You Feel About Your Child's Progress In The Early Intervention Program? Delighted 1 2 3 4 5 6 7 8 9 10 Terrible

Consider The Last Five Times You Were Alone With Your Child ..... On How Many of Those Occasions Did You Feel Happy?
___ On No Occasion ___ 1 of 5 Occasions ___ 2 of 5 Occasions ___ 3 of 5 Occasions ___ 4 of 5 Occasions ___ On All Occasions

PLEASE FEEL FREE TO ADD FURTHER THOUGHTS AND COMMENTS. THANK-YOU FOR YOUR TIME AND PARTICIPATION IN THIS STUDY.

COMMENTS: ____________________

Appendix III

Family Stress and Coping Questionnaire -- Control Group

FAMILY STRESS AND COPING QUESTIONNAIRE

PART I

PLEASE ANSWER ALL PARTS OF THIS QUESTIONNAIRE AS COMPLETELY AND HONESTLY AS POSSIBLE — THERE ARE NO RIGHT OR WRONG ANSWERS.
WHEN ANSWERING THE QUESTIONS PLEASE THINK ABOUT YOUR YOUNGEST CHILD (2½ YEARS OF AGE OR YOUNGER).
ONE QUESTIONNAIRE PER PARENT PLEASE — IF BOTH PARENTS ARE RESPONDING PLEASE COMPLETE SEPARATE QUESTIONNAIRES.
ALL THE INFORMATION YOU PROVIDE WILL BE USED FOR RESEARCH PURPOSES ONLY AND WILL BE KEPT STRICTLY CONFIDENTIAL.

Study #: ________/________/________ This Questionnaire Was Completed On: ______ (Day) ______ (Month) ______ (Year)

Age of Child:	___ Under 1 Month	___ 13-18 Months (1-1½ Years)	___ 31-36 Months (2½-3 Years)	Sex of Child:	___ Female
	___ 1-6 Months	___ 19-24 Months (1½-2 Years)	___ 37-42 Months (3-3½ Years)		___ Male
	___ 7-12 Months	___ 25-30 Months (2-2½ Years)	___ 42-48 Months (3½-4 Years)		

Your Relationship to This Child: ___ Mother ___ Father ___ Foster-Mother ___ Foster-Father ________________ Other (specify)

Who Usually Cares for This Child During the Day? __ Parent or Foster-Parent __ Relative __ Babysitter __ Daycare / Preschool
__ Other (please specify) ____

How Many Other Children Under the Age of 6 Years Are in Your Home (please provide their ages)? ______________________________

Do You Think Your Child Has a Serious Handicap, Health Problem, or Behaviour Problem? ____ Yes ____ No ____ Not Sure

Your Marital Status: ___ Married ___ Single ___ Living with Male / Female Friend ___ Separated ___ Divorced ___ Widowed

Your Present Age: ___ Under 18 years ___ 18-23 years ___ 24-29 years ___ 30-40 years ___ 40-50 years ___ Over 50 years

Ethnicity / Culture of Your Family: ___ White ___ North American Indian ___ Asian/Oriental ___ East Indian ___ African
___ Other (please specify) ____

Religion: ________________________ Is Religion an Important Part of Your Family Life? ___ Yes ___ No ___ Somewhat

Education (please indicate your highest level achieved): __ Elementary or Grade School __ Some High School __ High School Diploma
__ Some College or University __ College Diploma __ University Degree

Employment (please indicate your current status): ___ Full-time ___ Part-time ___ Homemaker ___ Unemployed ___ Student

-OVER-

PART II

How often do each of these following statements describe your current situation.	ALMOST NEVER	ONCE IN AWHILE	SOMETIMES	FREQUENTLY	ALMOST ALWAYS
1. Our family is under a lot of emotional stress					
2. We feel we don't have enough control over the direction our lives are taking					
3. Certain adult members of our family do all the giving while others do all the taking					
4. When we need something that can't be postponed we have enough money to cover it					
5. When we face problems or difficulties in our family, we:					
(a) Know that we have the strength within our own family to solve our problems					
(b) Accept stressful events as a fact of life					
(c) Escape by watching television					
(d) Rely on God to help us					
(e) Have a few drinks					
(f) Share our troubles with relatives, friends, or neighbours					
(g) Seek professional counseling and help for family difficulties					
6. How often did you feel this way during the past few weeks?					
(a) Pleased about having accomplished something					
(b) Particularly excited or interested in something					
(c) So restless that you couldn't sit long in a chair					
(d) Upset because someone criticized you					

PART III

To what extent do each of these following statements describe your current feelings.	STRONGLY DISAGREE	DISAGREE	NOT SURE	AGREE	STRONGLY AGREE
1. Physically I feel good most of the time					
2. When I do things for my child I get the feeling he/she appreciates my efforts					
3. My child does a few things which bother me a great deal					
4. This child seems to be much harder to care for than most children					
5. I enjoy being a parent to this child					
6. This child is more attached to me than to other people					
7. I give up more of my life to meet this child's needs than I thought I would have to					
8. I usually feel guilty about the way I feel towards my child					
9. Having this child has caused more problems than I expected in my relationship with my partner					
10. When I run into a problem taking care of this child, I have enough people to whom I can talk to get help or advice					

THANK-YOU VERY MUCH FOR YOUR HONEST ANSWERS TO ALL THESE QUESTIONS. YOUR CONTRIBUTION TO THIS STUDY IS VERY VALUABLE.

PLEASE RETURN THIS QUESTIONNAIRE TO THE UNIVERSITY OF ALBERTA IN THE ENVELOPE PROVIDED.

Appendix IV

Matrix Equations for Model A

1. $$\eta = B\eta + \Gamma\xi + \zeta \qquad \xi \dashrightarrow \phi = \begin{bmatrix}\phi_{11}\end{bmatrix}$$

$$\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\\ \eta_4\end{bmatrix} = \begin{bmatrix}0 & 0 & 0 & 0\\ 0 & 0 & 0 & 0\\ \beta_{31} & 0 & 0 & \beta_{34}\\ 0 & \beta_{42} & \beta_{43} & 0\end{bmatrix}\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\\ \eta_4\end{bmatrix} + \begin{bmatrix}\gamma_{11}\\ \gamma_{21}\\ \gamma_{31}\\ 0\end{bmatrix}\begin{bmatrix}\xi_1\end{bmatrix} + \begin{bmatrix}\zeta_1\\ \zeta_2\\ \zeta_3\\ \zeta_4\end{bmatrix} \qquad \zeta \dashrightarrow \Psi = \begin{bmatrix}\psi_{11} & & & \\ 0 & \psi_{22} & & \\ 0 & 0 & \psi_{33} & \\ 0 & 0 & 0 & \psi_{44}\end{bmatrix}$$

2. $$y = \Lambda_y \eta + \epsilon \qquad \epsilon \dashrightarrow \Theta_\epsilon$$

$$\begin{bmatrix}y_1\\ y_2\\ y_3\\ \vdots\\ \vdots\\ \vdots\\ \vdots\\ \vdots\\ \vdots\\ \vdots\\ \vdots\\ y_{12}\end{bmatrix} = \begin{bmatrix}1.0 & 0 & 0 & 0\\ \lambda_{21} & & & 0\\ \lambda_{31} & & & 0\\ 0 & 1.0 & & \vdots\\ 0 & \lambda_{52} & & \vdots\\ 0 & \lambda_{62} & & \vdots\\ \vdots & & 1.0 & \vdots\\ \vdots & & \lambda_{83} & \vdots\\ \vdots & & \lambda_{93} & \vdots\\ \vdots & & & 1.0\\ \vdots & & & \lambda_{11,4}\\ 0 & 0 & 0 & \lambda_{12,4}\end{bmatrix}\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\\ \eta_4\end{bmatrix} + \begin{bmatrix}\epsilon_1\\ \epsilon_2\\ \epsilon_3\\ \vdots\\ \vdots\\ \vdots\\ \vdots\\ \vdots\\ \vdots\\ \vdots\\ \vdots\\ \epsilon_{12}\end{bmatrix} \qquad \Theta_\epsilon = \begin{bmatrix}\theta_{\epsilon_{11}} & & & & \\ 0 & \theta_{\epsilon_{22}} & & & \\ 0 & 0 & \theta_{\epsilon_{33}} & & \\ \vdots & & & \ddots & \\ 0 & 0 & \cdots & \cdots & \theta_{\epsilon_{12,12}}\end{bmatrix}$$

3. $$x = \Lambda_x \xi + \delta \qquad \delta \dashrightarrow \Theta_\delta = \begin{bmatrix}\theta_{\delta_{11}}\end{bmatrix}$$

$$\begin{bmatrix}x_1\end{bmatrix} = \begin{bmatrix}1.0\end{bmatrix}\begin{bmatrix}\xi_1\end{bmatrix} + \begin{bmatrix}\delta_1\end{bmatrix}$$

Appendix V

Matrix Equations for Model B

1. $$\eta \quad = \quad B\eta \quad + \quad \Gamma\xi \quad + \quad \zeta \dashrightarrow \phi = \begin{bmatrix} \phi_{11} \end{bmatrix}$$

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & 0 \\ \beta_{21} & 0 & 0 & 0 \\ \beta_{31} & \beta_{32} & 0 & 0 \\ 0 & \beta_{42} & \beta_{43} & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} + \begin{bmatrix} \gamma_{11} \\ \gamma_{31} \end{bmatrix} \begin{bmatrix} \xi_1 \end{bmatrix} + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \\ \zeta_4 \end{bmatrix} \dashrightarrow \Psi = \begin{bmatrix} \psi_{11} & & & \\ 0 & \psi_{22} & & \\ 0 & 0 & \psi_{33} & \\ 0 & 0 & 0 & \psi_{44} \end{bmatrix}$$

2. $$y \quad = \quad \Lambda_y \eta \quad + \quad \epsilon$$

$$\begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ \vdots \\ \vdots \\ \vdots \\ \vdots \\ \vdots \\ \vdots \\ \vdots \\ \vdots \\ y_{12} \end{bmatrix} = \begin{bmatrix} 1.0 & 0 & 0 & 0 \\ \lambda_{21} & & & \vdots \\ \lambda_{31} & & & \vdots \\ 0 & 1.0 & & \vdots \\ 0 & \lambda_{52} & & \vdots \\ 0 & \lambda_{62} & & \vdots \\ \vdots & & 1.0 & \vdots \\ \vdots & & \lambda_{83} & \vdots \\ \vdots & & \lambda_{93} & \\ \vdots & & & 1.0 \\ \vdots & & & \lambda_{11,4} \\ 0 & 0 & 0 & \lambda_{12,4} \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} + \begin{bmatrix} \epsilon_1 \\ \epsilon_2 \\ \epsilon_3 \\ \vdots \\ \epsilon_{12} \end{bmatrix} \dashrightarrow \Theta_\epsilon = \begin{bmatrix} \theta_{\epsilon_{11}} & & & & \\ 0 & \theta_{\epsilon_{22}} & & & \\ 0 & 0 & \theta_{\epsilon_{33}} & & \\ \vdots & & & \ddots & \\ 0 & 0 & \cdots & \cdots & \theta_{\epsilon_{12,12}} \end{bmatrix}$$

3. $$x \quad = \quad \Lambda_x \xi \quad + \quad \delta$$

$$\begin{bmatrix} x_1 \end{bmatrix} = \begin{bmatrix} 1.0 \end{bmatrix} \begin{bmatrix} \xi_1 \end{bmatrix} + \begin{bmatrix} \delta_1 \end{bmatrix} \dashrightarrow \Theta_\delta = \begin{bmatrix} \theta_{\delta_{11}} \end{bmatrix}$$

Appendix VI

Matrix Equations for Model C

1. $\eta = B\eta + \Gamma\xi + \zeta \qquad \Phi = \begin{bmatrix}\phi_{11}\end{bmatrix}$

$$\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\\ \eta_4\end{bmatrix} = \begin{bmatrix}0&0&0&0\\0&0&0&0\\ \beta_{31}&\beta_{32}&0&0\\ \beta_{41}&\beta_{42}&\beta_{43}&0\end{bmatrix}\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\\ \eta_4\end{bmatrix} + \begin{bmatrix}\gamma_{11}\\ \gamma_{21}\\ \gamma_{41}\end{bmatrix}\begin{bmatrix}\xi_1\end{bmatrix} + \begin{bmatrix}\zeta_1\\ \zeta_2\\ \zeta_3\\ \zeta_4\end{bmatrix} \qquad \Psi = \begin{bmatrix}\psi_{11}&&&\\0&\psi_{22}&&\\0&0&\psi_{33}&\\0&0&0&\psi_{44}\end{bmatrix}$$

2. $y = \Delta_y \eta + \epsilon$

$$\begin{bmatrix}y_1\\ y_2\\ y_3\\ \vdots\\ \vdots\\ y_{12}\end{bmatrix} = \begin{bmatrix}1.0&0&0&0\\ \lambda_{21}&&&\vdots\\ \lambda_{31}&&&\vdots\\ 0&1.0&&\vdots\\ 0&\lambda_{52}&&\vdots\\ 0&\lambda_{62}&1.0&\vdots\\ \vdots&&\lambda_{83}&\vdots\\ \vdots&&\lambda_{93}&1.0\\ \vdots&&&\lambda_{11,4}\\ 0&0&0&\lambda_{12,4}\end{bmatrix}\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\\ \eta_4\end{bmatrix} + \begin{bmatrix}\epsilon_1\\ \epsilon_2\\ \epsilon_3\\ \vdots\\ \epsilon_{12}\end{bmatrix} \qquad \Theta_\epsilon = \begin{bmatrix}\Theta_{\epsilon_{11}}&&&\\0&\Theta_{\epsilon_{22}}&&\\0&0&\Theta_{\epsilon_{33}}&\\ \vdots&&&\ddots&\\0&0&\cdots&&\Theta_{\epsilon_{12,12}}\end{bmatrix}$$

3. $x = \Delta_x \xi + \delta \qquad \Theta_\delta = \begin{bmatrix}\Theta_{\delta_{11}}\end{bmatrix}$

$$\begin{bmatrix}x_1\end{bmatrix} = \begin{bmatrix}1.0\end{bmatrix}\begin{bmatrix}\xi_1\end{bmatrix} + \begin{bmatrix}\delta_1\end{bmatrix}$$

Appendix VII

Matrix Equations for Model D

1. $$\eta = B\eta + \Gamma\xi + \zeta$$

$$\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\end{bmatrix} = \begin{bmatrix}0 & 0 & 0\\ \beta_{21} & 0 & \beta_{23}\\ \beta_{31} & 0 & 0\end{bmatrix}\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\end{bmatrix} + \begin{bmatrix}\gamma_{11}\\ \gamma_{31}\end{bmatrix}\begin{bmatrix}\xi_1\end{bmatrix} + \begin{bmatrix}\zeta_1\\ \zeta_2\\ \zeta_3\end{bmatrix}$$

$$\dashrightarrow \Phi = \begin{bmatrix}\phi_{11}\end{bmatrix}$$

$$\dashrightarrow \Psi = \begin{bmatrix}\psi_{11} & & \\ 0 & \psi_{22} & \\ 0 & 0 & \psi_{33}\end{bmatrix}$$

2. $$y = \Lambda_y \eta + \epsilon$$

$$\begin{bmatrix}y_1\\ y_2\\ y_3\\ \vdots\\ y_9\end{bmatrix} = \begin{bmatrix}1.0 & 0 & 0\\ \lambda_{21} & & \vdots\\ \lambda_{31} & & \vdots\\ \vdots & 1.0 & \vdots\\ \vdots & \lambda_{52} & \vdots\\ \vdots & \lambda_{62} & 1.0\\ \vdots & & \lambda_{83}\\ 0 & 0 & \lambda_{93}\end{bmatrix}\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\end{bmatrix} + \begin{bmatrix}\epsilon_1\\ \epsilon_2\\ \epsilon_3\\ \vdots\\ \epsilon_9\end{bmatrix}$$

$$\dashrightarrow \Theta_\epsilon = \begin{bmatrix}\theta_{\epsilon_{11}} & & & & \\ 0 & \theta_{\epsilon_{22}} & & & \\ 0 & 0 & \theta_{\epsilon_{33}} & & \\ \vdots & & & \ddots & \\ 0 & 0 & \cdots & \cdots & \theta_{\epsilon_{99}}\end{bmatrix}$$

3. $$x = \Lambda_x \xi + \delta$$

$$\begin{bmatrix}x_1\\ x_2\\ x_3\end{bmatrix} = \begin{bmatrix}1.0\\ \lambda_{21}\\ \lambda_{31}\end{bmatrix}\begin{bmatrix}\xi_1\end{bmatrix} + \begin{bmatrix}\delta_1\\ \delta_2\\ \delta_3\end{bmatrix}$$

$$\dashrightarrow \Theta_\delta = \begin{bmatrix}\Theta_{\delta_{11}} & & \\ & \Theta_{\delta_{22}} & \\ & & \Theta_{\delta_{33}}\end{bmatrix}$$

Appendix VIII

Matrix Equations for Model E

1. $\eta = B\eta + \Gamma\xi + \zeta \dashrightarrow \Phi = \begin{bmatrix} \phi_{11} \end{bmatrix}$

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \\ \beta_{21} & 0 & 0 \\ 0 & \beta_{32} & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} + \begin{bmatrix} \gamma_{11} \\ \gamma_{31} \end{bmatrix} \begin{bmatrix} \xi_1 \end{bmatrix} + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \end{bmatrix} \dashrightarrow \Psi = \begin{bmatrix} \psi_{11} & & \\ 0 & \psi_{22} & \\ 0 & 0 & \psi_{33} \end{bmatrix}$$

2. $y = \Lambda_y \eta + \epsilon$

$$\begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ \vdots \\ \vdots \\ \vdots \\ y_9 \end{bmatrix} = \begin{bmatrix} 1.0 & 0 & 0 \\ \lambda_{21} & & \vdots \\ \lambda_{31} & 1.0 & \vdots \\ \vdots & \lambda_{52} & \vdots \\ \vdots & \lambda_{62} & 1.0 \\ \vdots & & \lambda_{83} \\ 0 & 0 & \lambda_{93} \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} + \begin{bmatrix} \epsilon_1 \\ \epsilon_2 \\ \epsilon_3 \\ \vdots \\ \epsilon_9 \end{bmatrix} \dashrightarrow \Theta_\epsilon = \begin{bmatrix} \theta_{\epsilon_{11}} & & & \\ 0 & \theta_{\epsilon_{22}} & & \\ 0 & 0 & \theta_{\epsilon_{33}} & \\ \vdots & & & \ddots \\ 0 & 0 & \cdots & \theta_{\epsilon_{99}} \end{bmatrix}$$

3. $x = \Lambda_x \xi + \delta$

$$\begin{bmatrix} x_1 \end{bmatrix} = \begin{bmatrix} 1.0 \end{bmatrix} \begin{bmatrix} \xi_1 \end{bmatrix} + \begin{bmatrix} \delta_1 \end{bmatrix} \dashrightarrow \Theta_\delta = \begin{bmatrix} \theta_{\delta_{11}} \end{bmatrix}$$

Appendix IX

Matrix Equations for Model F

1.
$$\eta \quad = \quad B\eta \quad + \quad \Gamma\xi \quad + \quad \zeta$$

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \\ \eta_6 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & & & & & \vdots \\ 0 & & & & & \vdots \\ \beta_{41} & \beta_{42} & \beta_{43} & & & \vdots \\ 0 & & & \beta_{54} & & \vdots \\ 0 & 0 & 0 & \beta_{64} & \beta_{65} & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \\ \eta_6 \end{bmatrix} + \begin{bmatrix} \gamma_{11} \\ \gamma_{21} \\ \gamma_{31} \end{bmatrix} \begin{bmatrix} \xi_1 \end{bmatrix} + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \\ \zeta_4 \\ \zeta_5 \\ \zeta_6 \end{bmatrix}$$

$$\xi \dashrightarrow \Phi = \begin{bmatrix} \phi_{11} \end{bmatrix}$$

$$\zeta \dashrightarrow \Psi = \begin{bmatrix} \psi_{11} & & \\ 0 & \psi_{22} & \\ \vdots & & \ddots \\ 0 & \cdots & \psi_{66} \end{bmatrix}$$

2.
$$y \quad = \quad \Lambda_y \eta \quad + \quad \epsilon$$

$$\begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ \vdots \\ \vdots \\ y_{18} \end{bmatrix} = \begin{bmatrix} 1.0 & \cdots & \cdots & \cdots & \cdots & 0 \\ \lambda_{21} & & & & & \vdots \\ \lambda_{31} & & & & & \vdots \\ \vdots & 1.0 & & & & \vdots \\ \vdots & \lambda_{52} & & & & \vdots \\ \vdots & \lambda_{62} & & & & \vdots \\ \vdots & & 1.0 & & & \vdots \\ \vdots & & \lambda_{83} & & & \vdots \\ \vdots & & \lambda_{93} & & & \vdots \\ \vdots & & & 1.0 & & \vdots \\ \vdots & & & \lambda_{11,4} & & \vdots \\ \vdots & & & \lambda_{12,4} & & \vdots \\ \vdots & & & & 1.0 & \vdots \\ \vdots & & & & \lambda_{14,5} & \vdots \\ \vdots & & & & \lambda_{15,5} & \vdots \\ \vdots & & & & & 1.0 \\ \vdots & & & & & \lambda_{17,6} \\ 0 & \cdots & \cdots & \cdots & \cdots & \lambda_{18,6} \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \\ \eta_6 \end{bmatrix} + \begin{bmatrix} \epsilon_1 \\ \epsilon_2 \\ \epsilon_3 \\ \vdots \\ \vdots \\ \epsilon_{18} \end{bmatrix}$$

$$\epsilon \dashrightarrow \Theta_\epsilon = \begin{bmatrix} \theta_{\epsilon_{11}} & & & & \\ 0 & \theta_{\epsilon_{22}} & & & \\ \vdots & & \theta_{\epsilon_{33}} & & \\ \vdots & & & \ddots & \\ 0 & \cdots & \cdots & \cdots & \theta_{\epsilon_{18,18}} \end{bmatrix}$$

3.
$$x \quad = \quad \Lambda_x \, \xi \quad + \quad \delta$$

$$\begin{bmatrix} x_1 \end{bmatrix} = \begin{bmatrix} 1.0 \end{bmatrix} \begin{bmatrix} \xi_1 \end{bmatrix} + \begin{bmatrix} \delta_1 \end{bmatrix} \dashrightarrow \Theta_\delta = \begin{bmatrix} \theta_{\delta_{11}} \end{bmatrix}$$

Appendix X

Sampling of Calgary Day Care Centers

Following is a list of the twenty day care centers approached for access to families with young healthy children. The day care centers were selected on the basis of their location near a program family. The intent was to approximate the environmental and socio-economic conditions of Treatment Group families and Control Group families, by matching their location of residence. It was assumed that most children who attended a neighbourhood day care, would also live in that area of the city.

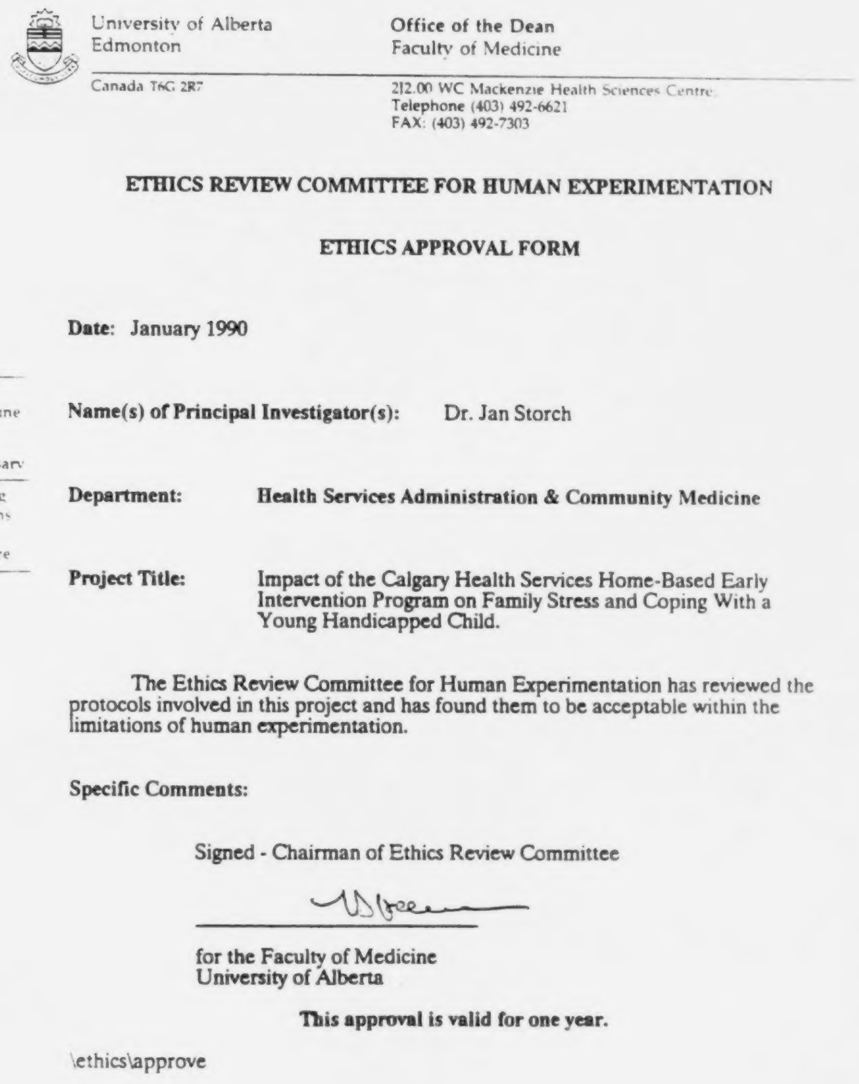
Day care centers that cared for very young infants, and children on a drop-in basis, were oversampled. This was to compensate for an anticipated shortfall in control families with children under six months of age, and "stay-at-home" mothers.

After the name of each facility, is the neighbourhood and number of families approached for participation in the study. A large number of families (i.e. 250) was sampled for the Control Group, because consent and continued participation in the study were expected to be very low.

DOVER KINDERCARE (Dover S.E.) (10)
SANDSTONE CHILD LEARNING CENTER (Sandstone N.W.) (10)
KIDSLAND DAY CARE (Beddington Heights N.W.) (10)
HUNTINGTON HILLS DAYCARE (Huntington Hills N.E.) (10)
TINKERBELL DAY CARE (Thorncliff N.W.) (10)
HIGHLAND DAY NURSERY (Highland Park N.W.) (10)
FALCONRIDGE COMMUNITY DAY CARE (Falconridge N.E.) (15)
RUNDLE DAY CARE (Rundle N.E.) (15)
ABBEYDALE KINDERCARE CENTER (Abbeydale N.E.) (10)
FOREST HEIGHTS DAY CARE (Forest Lawn S.E) (10)
RADISSON HEIGHTS DAY CARE (Radisson Heights S.E.) (10)
JUST BABIES - INFANT CARE CENTER (Parkland S.E.) (15)
MILLRISE KINDERCARE (Millrise S.W.) (15)
MIDNAPORE CHILD CARE (Midnapore S.E.) (15)
MIDNAPORE PROFESSIONAL DAY CARE (Midnapore S.E.) (10)
SMURFVILLE DAY CARE (Cedarille S.W.) (15)
SMURFVILLE DAY CARE (Glenbrook S.W.) (15)
SILVERSPRINGS DAY CARE (Silversprings N.W.) (15)
RANCHLANDS PLAYCARE (Ranchlands N.W.) (15)
EDGEMONT CHILDCARE (Edgemont N.W.) (15)

Appendix XI

University of Alberta Ethics Approval Form



University of Alberta
Edmonton
Canada T6G 2R7

Office of the Dean
Faculty of Medicine
212.00 WC Mackenzie Health Sciences Centre
Telephone (403) 492-6621
FAX: (403) 492-7303

ETHICS REVIEW COMMITTEE FOR HUMAN EXPERIMENTATION

ETHICS APPROVAL FORM

Date: January 1990

Faculty
of Medicine
75th
Anniversary
preparing
Physicians
for
the Future

Name(s) of Principal Investigator(s): Dr. Jan Storch

Department: **Health Services Administration & Community Medicine**

Project Title: Impact of the Calgary Health Services Home-Based Early Intervention Program on Family Stress and Coping With a Young Handicapped Child.

The Ethics Review Committee for Human Experimentation has reviewed the protocols involved in this project and has found them to be acceptable within the limitations of human experimentation.

Specific Comments:

Signed - Chairman of Ethics Review Committee

for the Faculty of Medicine
University of Alberta

This approval is valid for one year.

\ethics\approve

Appendix XII

Introductory Letter to Treatment Group Families -- Time 1

February 12, 1990

Dear Parent(s):

I am a graduate student in the Faculty of Medicine at the University of Alberta. Part of my studies involve research into the Effectiveness of the Calgary Health Services Early Intervention Program. I am interested in evaluating this program's impact on family stress and coping with a young child who has special needs.

I would be very grateful if you and/or your partner (preferably both) would consent to participate in this study. If you are willing to be part of the study please sign and return the enclosed consent form. Participation in this study would require about 15 minutes of your time to complete a simple questionnaire about stress. Enclosed are two copies of the questionnaire -- one for each of you to complete and return now, if you are willing to participate in the study. I need to send you the same questionnaire again in June and November of this year. Each time the questionnaire will be mailed to you with a stamped envelope for return to the University of Alberta.

It is important for you to know that participation in this study is voluntary, and all information you provide will be kept confidential. If you choose not to participate or wish to withdraw at a later time, your treatment in the program will not be affected. Your individual answers will not be shared with other parents or the Early Intervention Program staff, and your name will not appear on any answer sheets or reports. This study has been fully approved by the University of Alberta and Calgary Health Services.

The information you provide is very valuable and will help the Early Intervention Program to provide a better service to you and your child. I would be happy to provide you a copy of the results when the study is completed. If you have any questions or concerns about the study at any time during the year, please contact:

Mary Perry or Dr. Jan Storch
Department of Health Services Administration
Faculty of Medicine
13-103 Clinical Sciences Building
UNIVERSITY OF ALBERTA
Edmonton, Alberta
T6G 2G3
Phone: 492-6416

I can also be reached through your Early Intervention staff member. Thank-you for your time and participation.

Yours truly,

M. Perry

Mary Perry
Graduate Student
Health Services Administration
University of Alberta

Appendix XIII

Research Consent Form

CONSENT FORM

Please read this form carefully. If you are willing to participate in the research study, please sign below and return this form in the envelope provided. Thank-you!

By signing this consent form, I understand that I will be participating in a research study conducted by Mary Perry as part of the requirements for a Masters Degree in Health Services Administration at the University of Alberta. I have been informed about the purpose and procedures for this study in a letter from Mary Perry.

I understand that my answers will be kept confidential, and that my name will not appear on any information that I provide. This information will be analyzed with that of other participants in this study and will be reported in group statistics.

My participation in this study is voluntary and I am aware there will be no payment. I am free to withdraw from the study at any time without consequence. I have the telephone number of Mary Perry and Dr. Jan Storch if there are questions or concerns about the study. A copy of the results will be made available to me if I so desire.

Date: ______________ Signature: ____________________
(mother)

Signature: ____________________
(father)

Name and Mailing Address (please print):

____

____

____

____

Appendix XIV

Introductory Letter to Pre-Treatment Group Families

Dear Parent(s):

Welcome to the Calgary Health Services Early Intervention Program! I am a graduate student in the Faculty of Medicine at the University of Alberta. Part of my studies involve research into the Effectiveness of the Early Intervention Program. I am particularly interested in studying family stress and coping before and after home visits have been established.

Since you are new to the program I would be very grateful if you and/or your partner (preferably both) would consent to participate in this study. If you are willing to be part of the study please sign and return the enclosed consent form. Participation in this study would require about 15 minutes of your time to complete a simple questionnaire about stress. Enclosed are two copies of the questionnaire -- one for each of you to complete and return now, if you are willing to participate in the study. I need to send you the same questionnaire again in June and/or November once you have had a few home visits. Each time the questionnaire will be sent with a stamped envelope for return to the University of Alberta.

It is important for you to know that participation in this study is voluntary, and all information you provide will be kept confidential. If you choose not to participate or wish to withdraw at a later time, your treatment in the program will not be affected. Your individual answers will not be shared with other parents or the Early Intervention Program staff, and your name will not appear on any answer sheets or reports. This study has been fully approved by the University of Alberta and Calgary Health Services.

The information you provide is very valuable and will help the Early Intervention Program to provide a better service to you and your child. I would be happy to provide you a copy of the results when the study is completed. If you have any questions or concerns about the study at any time during the year, please contact:

Mary Perry or Dr. Jan Storch
Department of Health Services Administration
Faculty of Medicine
13-103 Clinical Sciences Building
UNIVERSITY OF ALBERTA
Edmonton, Alberta
T6G 2G3
Phone: 492-6416

I can also be reached through your Early Intervention staff member. Thank-you for your time and participation.

Yours truly,

M. Perry

Mary Perry
Graduate Student
Health Services Administration
University of Alberta

Appendix XV

Introductory Letter to Control Group Families -- Time 1

February 12, 1990

Dear Parent(s):

I am a graduate student in the Faculty of Medicine at the University of Alberta. Part of my studies involve research into parents' stress and coping with a young handicapped child, and the special community services available for these families in Calgary. I am interested in comparing these families over time with other families who have healthy young children. It is my understanding that you have at least one healthy child under the age of 2½ years in your home.

I would be very grateful if you and/or your partner (preferably both) would consent to participate as a comparison family in this study. If you are willing to be part of this study please sign and return the enclosed consent form. Your participation would greatly assist families with handicapped children. The study would require just 10 minutes of your time to complete a simple questionnaire about stress. Enclosed are two copies of the questionnaire -- one for each of you to complete and return now, if you are willing to participate in the study. I need to send you the same questionnaire again in June and November of this year. Each time the questionnaire will be mailed to you with a stamped envelope for return to the University of Alberta.

It is important for you to know that participation in this study is voluntary, and all information you provide will be kept confidential. If you choose not to participate or wish to withdraw at a later time, there will be no consequences for you. Your individual answers will not be shared with anyone, and your name will not appear on any answer sheets or reports. This study has been fully approved by the University of Alberta and Calgary Health Services.

The information you provide is very valuable and will help Calgary Health Services provide better programs for families with a handicapped child. If you are interested I can provide you a copy of the results when the study is completed. If you have any questions or concerns about the study at any time during the year, please contact:

Mary Perry or Dr. Jan Storch
Department of Health Services Administration
Faculty of Medicine
13-103 Clinical Sciences Building
UNIVERSITY OF ALBERTA
Edmonton, Alberta
T6G 2G3
Phone: 492-6416

Thank-you for your time and participation in this study.

Yours truly,

M. Perry

Mary Perry
Graduate Student
Health Services Administration
University of Alberta

Appendix XVI

Introductory Letter to Treatment Group Families -- Time II

July 3, 1990

Dear Parent(s):

Earlier this year you agreed to participate in a research study that evaluates the effectiveness of the Early Intervention Program. Thank-you very much for the questionnaire(s) you returned in February/March. Since this study tries to determine the impact of the program over a period of time, I need to ask you and your partner to complete the same questionnaire again. Some of the information may not have changed in the last few months, for example your religion and culture -- it is okay to leave these few items blank if you wish. We are mostly interested in your thoughts and feelings about your child at this time, and his/her progress in the program. Please return your completed questionnaire(s) as soon as possible, in the enclosed envelope to the University of Alberta.

I would like to remind you that your participation in this study is voluntary, and all information you provide is kept strictly confidential. If you choose not to continue in this study, your treatment in the program will not be affected. Your individual answers will not be shared with other parents or the Early Intervention Program staff, and your name will not appear on any answer sheets or reports. This study has been fully approved by the University of Alberta and Calgary Health Services.

The information you provide is very valuable and will help the Early Intervention Program to provide a better service to you and your child. If you have any questions or concerns about the study at any time during the year, I can be reached through your Early Intervention staff member. Thank-you again for your time and participation.

Yours truly,

M. Perry

M.A. Perry
Graduate Student
Health Services Administration
University of Alberta

Appendix XVII

Introductory Letter to Treatment Group Families -- Time III

November 23, 1990

Dear Parent(s):

Earlier this year you consented to participate in a research study that evaluates the effectiveness of the Early Intervention Program. You have already completed and returned at least one questionnaire, and for this I thank you very much. Many of you completed the questionnaires twice (in February and July), adding to the quality of the research project. Since this study tries to determine the impact of the program over a period of time, I need to ask you and your partner to complete the same questionnaires one last time. Some of the information may not have changed in the last few months, for example your religion and culture; it is okay to leave these few items blank if you wish. We are mostly interested in your thoughts and feelings about your child at this time, and his/her progress in the Early Intervention Program. Please return your completed questionnaires as soon as possible, in the enclosed envelope to the University of Alberta.

I would like to remind you that your participation in this study is voluntary, and all information you provide is kept strictly confidential. If you choose not to continue in this study, your treatment in the program will not be affected. Your individual answers will not be shared with other parents or the Early Intervention Program staff, and your name will not appear on any answer sheets or reports. This study has been fully approved by the University of Alberta and Calgary Health Services.

The information you provide is very valuable and will help the Early Intervention Program to provide a better service to you and your child. If you have any questions or concerns about the study at any time during the year, I can be reached through your Early Intervention staff member. I would be happy to provide a copy of the results when the project is completed. Thank-you again for your time and continued participation in this study.

Yours truly,

M. Perry

M.A. Perry
Graduate Student
Health Services Administration
University of Alberta

Appendix XVIII

Introductory Letter to Control Group Families -- Time II

July 3, 1990

Dear Parent(s):

Earlier this year you agreed to participate in a research study comparing families of handicapped children with families of healthy young children. Thank-you very much for the questionnaire(s) you returned in February/March. Your participation as a comparison family is extremely important. Since this study tries to measure changes in parents' stress and coping over a period of time, I need to ask you and your partner to complete the same questionnaire again. Some of the information may not have changed in the last few months, for example your religion and culture -- it is okay to leave these few items blank if you wish. We are mostly interested in your thoughts and feelings about your child at this time. Please return your completed questionnaire(s) as soon as possible, in the enclosed envelope to the University of Alberta.

I would like to remind you that participation in this study is voluntary, and all information you provide will be kept confidential. If you choose not to continue in this study, there will be no consequences for you. Your individual answers will not be shared with anyone, and your name will not appear on any answer sheets or reports. This study has been fully approved by the University of Alberta and Calgary Health Services.

The information you provide is very valuable and will help Calgary Health Services evaluate the programs they provide for families with a handicapped child. If you have any questions or concerns about the study at any time during the year, please contact:

Mary Perry or Dr. Jan Storch
Department of Health Services Administration
Faculty of Medicine
13-103 Clinical Sciences Building
UNIVERSITY OF ALBERTA
Edmonton, Alberta
T6G 2G3
Phone: 492-6416

Thank-you again for your time and continued participation in this study.

Yours truly,

M. Perry

M.A. Perry
Graduate Student
Health Services Administration
University of Alberta

Appendix XIX

Introductory Letter to Control Group Families -- Time III

November 23, 1990

Dear Parent(s):

Earlier this year you consented to participate in a research study comparing families of handicapped children with families of healthy young children. Thank-you very much for the questionnaires you returned in February and July. Your participation as a comparison family is extremely important. Since this study tries to measure changes in parents' stress and coping over a period of time, I need to ask you and your partner to complete the same questionnaire one last time. Some of the information may not have changed in the last few months, for example your religion and culture; it is okay to leave these few items blank if you wish. We are mostly interested in your thoughts and feelings about your child at this time. Please return your completed questionnaire(s) as soon as possible, in the enclosed envelope to the University of Alberta.

I would like to remind you that participation in this study is voluntary, and all information you provide will be kept confidential. If you choose not to continue in this study, there will be no consequences for you. Your individual answers will not be shared with anyone, and your name will not appear on any answer sheets or reports. This study has been approved by the University of Alberta & Calgary Health Services.

The information you provide is very valuable and will help Calgary Health Services evaluate the programs they provide for families with a handicapped child. If you are interested I would be happy to provide you with a copy of the results, when the study is completed. If you have any questions or concerns about the project at any time during the year, please contact:

Mary Perry or Dr. Jan Storch
Department of Health Services Administration
Faculty of Medicine
13-103 Clinical Sciences Building
UNIVERSITY OF ALBERTA
Edmonton, Alberta
T6G 2G3
Phone: 492-6416

Thank-you again for your time, patience, and continued participation in this study.

Yours truly,

M. Perry

M.A. Perry
Graduate Student
Health Services Administration
University of Alberta

Appendix XX

Results of the Control Group Sampling Methodology

Following is a breakdown of the Calgary communities in which the participating Program and Control Group families resided.

Pre-Treatment Group Families

N.W.
Dalhousie
Sandstone Valley
Charleswood
Beddington Heights
Silversprings
Mount Pleasant

N.E.
Taradale

S.W.
Glengarry
Woodlands (2)
Britannia
Glenbrook
C.F.B. Calgary
Haysboro
Strathcona

S.E.
Applewood Park
Erin Woods
Penbrooke Meadows
Deer Run

Treatment Group Families

N.W.
Cambrian Heights
Silversprings
Edgemont
Bowness (2)
Charleswood
Westmount
Thorncliff
Beddington Heights

N.E.
Rundle
Falconridge
Abbeydale

S.W.
Woodbine
Braeside
Elbow Park
Oakridge

S.E.
Mills Estate
Ogden
Forest Heights
Acadia
Deer Run
Deer Ridge
Dover Glen
Douglasdale Estate
Sundance
Lake Bonavista

Control Group Families

N.W.
Beddington Heights (2)
Huntington Hills (2)
Sandstone Valley
Bowness
Varsity
Silversprings (2)
Scenic Acres
Hawkwood
Brentwood
Edgemont (3)

N.E.
Falconridge (3)
Castleridge
Pineridge
Rundle (2)
Abbeydale (2)
Marlborough

S.W.
Canyon Meadows
Millrise (3)
Glenbrook
Glengarry
Glendale
Signal Hill

S.E.
Dover (2)
Forest Heights (2)
Forest Lawn (2)
Southview
Penbrooke Meadows
Deer Ridge
McKenzie
Midnapore (4)

Rural
Millarville

Appendix XXI

Abridged Comments from Program Families

What do you find (or hope to find) helpful about the Early Intervention Program?

Support and encouragement; ideas to enhance her development.

Tips on simple stimulation and exercises to help our daughter develop as normally as possible; information on an informal level from our contact person on the various abilities and difficulties she has seen in other Down's children, to help us anticipate problems and help us form realistic goals.

Sharing experiences with someone who sees and knows about other Down's children and can relate anecdotal information on norms for development. She helps us focus regularly on fostering development.

Information.

Uncertain.

Help me help my baby as much as I can to develop and lead a normal life if possible.

Exercise ideas.

Support for my wife, and exercises to promote my child's development.

Ways to help my son's development.

Ideas about helping my child cope with his handicap.

Ways to stimulate our child to achieve her full potential.

To educate us on what can be done for her; finding out the newest information.

Suggestions to help our child learn to do things.

Ways to bring her along; which exercises are better for her; and an outside person interested in her well being.

If there is a problem to catch it early and correct it.

Family support and help in locating and using services available in the city.

A wealth of information.

To maintain his level of education to that of others the same age.

Knowledgeable about resources; very supportive people when I need help.

I hope to find the support and advice helpful in helping my daughter as well as myself deal with her not walking, and also in helping her learn to walk.

I am hoping that if there is something wrong, that this program will identify what might be the problem, and give us some possible answers as to what I can do to help my daughter.

The most helpful thing about the E.I.P. for me was the research done for me concerning things doctors were finding, and information on programs that might be relevant to our situation.

Physical exercises for the child.

It is very good for the child to know what we expect from him/her and help him/her achieve it.

Different ideas about positions and ways to familiarize myself with my child.

A little bit of understanding towards how I can help my child through some problems we may come across.

Support and encouragement.

It's supportive.

It would guide me on my child's development and progress.

It helps to develop my child to normal growth.

To make my child normal.

They have home service.

Schedule flexible, waiting list not too long, house visits.

Ideas for stimulation, etc.

More ways of helping child; specific stage-related activities; regular reminder to keep actively working with child.

It's constant reinforcement for my child within his world.

The friendship provided and the positive reinforcement.

The direction we receive in regards to exercises we can do with our child to help get him going. The extra support is good. Their expertise in this area and the contacts and referrals they can give us i.e. physiotherapist, etc.

Follow-up to see if any improvements have been made; the teaching in terms of how I can help my child improve; the ability to talk to someone who is objective and knowledgeable.

Advanced development of child.

Assistance with exercises to help her muscle tone and development towards crawling, walking, talking, etc.; any aids that will help her develop and possibly integrate her into school later.

That there is always somebody around to check up on our child.

Somebody comes to our home on a regular basis; always the same person that looks after the child.

Ideas and perspective; realistic activities for our baby.

Ideas and encouragement.

Having someone who knows what's going on and helping me to keep on top of everything.

They've been very helpful, caring, and friendly.

They have helped me a great deal in the development of my child. They also reassure me that I'm doing a good job of teaching him skills. They also relay many great suggestions that can be used.

It helps me to help him learn new steps in his development.

It gave me a lot of ideas to keep up with my child's demands.

Taught us a few things we didn't know about keeping our child's growth and learning abilities.

We hope to get help in getting his speech up to a level more in tune with his age.

Its assistance in bringing our child to the right people and resources in order to bring his speech to a level of communication he should have for his age.

Information provided, ideas and tasks to use to help him.

A never ending source of ideas.

To provide tips, procedures, and other information to help us help our child.

I enjoy the interaction between the worker and myself, in that I can discuss the "Ups and Downs" in the child's physical condition without being made to feel stupid.

It's one way of hearing about other programs for my child; a good source of information.

Encouragement, guidelines, advice.

Support, resources.

One on one attention for my child; experienced staff; gives me more time to spend on spouse and other child.

To stimulate my children; I get really helpful advice to help nurture their education.

Suggestions on encouraging his development.

Ideas to help my child.

The exercises and suggestions.

The suggestions about what toys to buy for him, and someone to talk to who understands my son's problem.

They have showed us a great deal to help advance my son.

Better development in his way of life; helps us to help him in more ways than we had known before E.I.P.

Having someone else to show us how to reach my child at his own level.

I found that my child is not developmentally delayed, and he keeps up with other babies his age.

The exercises.

I like the extra stimulation and the helpful hints to help her out around the house; also the intervention worker helps me with resources I need.

It's still to early to say after only two visits.

The worker has been very patient and encouraging. She is willing to spend a lot of time with us if necessary. I feel very comfortable with the ideas and suggestions she gives us.

Allow our daughter to progress as normally (close to average) as possible.

Someone to talk about our daughter's disability; someone to provide us with information on how to help her progress.

Ideas on how to make playtime fun for her as well as helping her developmentally.

Help him develop as much as he can.

Reinforcement about the progress our daughter is making from visit to visit; suggestions of ways to help her improve her progress.

Constant monitoring of the progress she is or isn't making. The loaning of toys (or tools) to help in her development is very helpful.

Assist us in helping our daughter develop as close to normal as possible.

Aids in teaching my child.

Helpful learning about child development; good mental support.

Support and constructive suggestions to approach the problem or situation; also suggestions which were very helpful in other areas.

Reassurance that he is physically and mentally healthy.

Special hints and suggestions as to what he should be doing, and ways to promote growth; suggestions of other programs to help.

Aids to help him discover new games; supports mother with rearing the child and at Perinatal Clinic;

swimming at the Fanning Center is good; the Hannon speech course was also good.

Having a professional concur with our observations, thoughts, and feelings; getting new and different ideas to assist in the development of our daughter; helps us that she comes in the evenings and we can involve other caregivers.

Hope that the program with help her reach her maximum potential.

Intially gave us many ideas to pursue regarding milestones -- after about 1 1/2 years our child appeared to be meeting most milestones appropriately, but direction from Early Intervention helped us work towards areas that were of more difficulty for her, i.e. fine motor activities, also lent us toys that were useful.

They are aware of other programs throughout the city that may be helpful to my child or helpful to me as a parent. I also use the program because our worker brings developmentally appropriate toys for my daughter to use -- when she grows out of that stage we can give them back.

Developmental goals and strategies to help her achieve those goals.

At the beginning suggestions were helpful and not having to leave home were great. Now we are growing out of this service.

Convenience; reports show progress.

Resources and ideas.

Feedback from the worker.

Worker is very understanding and gives me good reports so I can work with my child.

Not sure.

Has helped the child come up to her proper level of development.

Visits in the home; feedback for parents on what activities to stress and how to stress them to be most effective.

Suggestions to promote development, especially what to concentrate on.

Knowledge and experience in the matters relating to child development. Ideas on exercises to work on, purposeful play activities, loaning of specialized toys to assist our efforts.

Convenience; provides focus for interactions and play; communication activities which will help to pattern and promote her development.

Information about other services available for my child.

Appendix XXII

Abridged Comments from Program Families

Do you have any suggestions for improving the services offered by the Early Intervention Program?

No. (most frequent response)

Unable to comment as yet.

I don't know specifically. I believe my frustrations with the program are due to great differences between the therapist and myself. She is young and full of textbook ideas. I am older and have experiential as well as textbook learning.

Can't think of any.

Bring back Liz!

Not at this time.

I like the program as it is. I find it helpful and convenient.

Publicize it more; more frequent visits.

Make the service available for a longer period of time after a child has been accepted into a therapy program.

I'm very pleased so far.

It is the only program we are in and it satisfies all our needs. Our E.I. worker is great and she's almost part of the family now, which is the icing on the cake.

Just that the administrative staff take a better look at what the field workers do, and how important it is to us that they continue to help parents.

Get better office staff or have them try home visits for awhile.

Let home visitors employ new methods and technics if available, instead of having the same old technics. Times change!

Not really.

Pretty pleased overall.

No, they are doing a good job.

None, but keep it up.

I like it the way it is.

More regular visits.

None. We are very pleased with our worker; she has gone out of her way to help us adjust and to help us by teaching.

Some more advanced equipment for gross motor development; small slide, climbing toys, baby trampoline, also tape recorders and tapes for language, and puppets for lending.

Keep up the swimming program.

That E.I. workers sit in on grief counselling seminars. They might not fully understand how a parent feels, but they would have a better awareness of where a parent is in the grief cycle and be more sensitive to their feelings and emotional needs.

I think the E.I. workers should have more training in each of the specific handicaps of their clients e.g. Down Syndrome.

Comments and suggestions should be geared toward helping the parent as well as the child, i.e. offer lots of praise for the child's accomplishments and for all the hard work the parent has done. Then gently focus on the child's weaknesses and delayed areas of development. Sometimes the child may have made little or no progress since the last visit and the E.I. worker's role that day might shift to encouragement for the parent and simply listening. Perhaps offer a few more toys rather than another long list of never-ending goals.

An actual physio and possibly O.T., as these are only available at the Hospital. The Early Intervention workers appear to need this support as they lack training specific to these professionals.

My experience is that it is a super program -- they respond quickly to my needs and have done extra research and investigation to ensure my child's special needs are all met to the maximum.

Appendix XXIII

Abridged Comments from Program Families

What changes (if any) have you seen in your child, yourself, and your family since enrolling in the Early Intervention Program?

We feel happy for the support and guidance in her development during these first crucial years.

Time will tell.

She is stronger, having been gently encouraged to do exercises we wouldn't have done otherwise. She is very alert and aware and sociable.

We have adjusted to the handicap over time. There is more acceptance of her as an individual rather than a "label", as she develops personality and communication.

Some of the exercises / ideas given have been helpful. Most though are things we would do with her naturally. I have actually by now gained the perspective that the program has been an extra frustration to me -- our intervention worker seems to work "by the book" and has tended to make me feel inept, and that our little one is extra slow by suggesting she reach for toys at four months of age (too soon!). The numerous complicated stimulation suggestions have often overwhelmed me. Our baby is doing everything in her own time and perhaps in spite of us all.

He is becoming a bit stronger. Progress is slow but consistent.

Some muscle development.

I'm more confident and E.I.P. has given me more ideas in helping my child.

Too early to tell.

Child progressing well.

She's coming along just fine.

I'm happy to know something can and is being done.

We've been able to assist our child in learning new tasks.

None. We have only been enrolled a short time. She does enjoy doing the suggested exercises and activities. She does continue to progress at the same rate in her skills as in the past, so it is hard to tell if the program is helping her.

Most of the changes in my child have been in physical development and mental development, not due to any intervention as she hasn't been involved in any physical therapy and she is mentally impaired. In myself, I find myself having a better idea of what to expect in dealing with doctors, social workers. I also have better ideas about where to go for information should I need it.

The program has strengthened our hope for the child to be a more normal child.

We have more hope and strength.

I feel more confident about what I am doing with my child.

No changes, just growth in my child.

An increase in her motor development -- but we're unsure of whether it's the program or a change in her diet, or a combination of both.

She has an increased energy level.

It's early to tell yet for the child -- we haven't seen any changes after two weeks. For our family, we are happy that we participate with the Early Intervention Program. I should have called them earlier the first time it was referred to us.

The results are encouraging to me.

I don't see anything that is delayed with my child yet.

In the space of three weeks, she is standing up and holding on to furniture, she is slowly moving around furniture, and she climbs stairs.

Child seems to respond to extra attention just as much as to the exercises themselves. This extra attention was probably necessary more so since older sibling captures most of it because of his speech problems.

By sixteen months she is finally walking. Techniques learned during the program may have helped.

The child has made steady progress with the program, but I think she may have done as well by herself. However it is always good to have something to fall back on if things don't progress well.

More concentrated effort on watching his progress.

I have seen my child progress -- very slowly but always forward. I am thankful for the help and input and glad to hear my guilt and grieving are natural for parents of a handicapped child. I always knew something was wrong, but now the family knows and E.I.P. helped make the family accept the problem in a positive way.

Our child does seem to be progressing which may suggest he is just slightly delayed. Whether or not this is due to the program is hard to say. The program, I'm sure will help us accept our child's handicap if it turns out he has one or some. It would not come as a complete shock. In addition, we would feel that we intervened early and tried our hardest. The program has also made this child's presence felt much more, as now we are encouraged to engage him as much as possible. He is a very "easy baby" and could/will tolerate long periods of time just passively observing while sitting quietly in his chair.

Progressing well -- we started our own intervention while waiting.

Child has improved strength in upper body, especially stomach muscles through suggested exercises.

Just recently she has made good progress in her gross motor skills and E.I.P. played a part in that.

My child has made a lot of progress in the last few months. Thanks partially to the therapist from E.I.P., who always keeps in touch and works with the other therapists.

He has certainly developed. Too soon to say if it had anything to do with the program, however being in the program keeps me directed in helping him.

It's hard to say about my child. I'm accepting he's handicapped and am glad to consider ideas that may help him. Our worker suggested a respite care program which has been a god-send to our family.

I've seen many changes. His attitude is much better. He's happier and progressing just as fast as any "normal" child would. He interacts very normally with other children, and his progress gets faster and faster with every week that passes.

I've learned to understand my son's problem and not to blame anyone for his problem.

My son is progressing at a normal rate and that is very important to me.

Coping better with certain situations. He is a lot more interested in doing things.

He's more attentive, independent, and willing to learn.

We haven't been involved long enough to truthfully answer this question.

His transition from Early Intervention to P.A.C.E.E. has greatly increased his vocabulary and his need to communicate verbally. I feel Early Intervention helped him prepare for P.A.C.E.E.

The Early Intervention Program has helped us find services we needed. It put us in contact with groups that could help us and although he has outgrown the program, our worker has been a great help coordinating his progress to preschool.

He is trying to speak more; more interested in communicating verbally.

The exercises have helped the child tremendously.

My daughter initially was quite debilitated. She is now alert, smiling, responsive, and walking with slight weakness. She is speech delayed but has good comprehension of speech. We have as a family worked very hard and have treated her "normally". Her older sister has provided incredible stimulation and love. She has had to date an amazing recovery, and E.I.P. has helped to guide us.

Improved eye movement.

Decreased arching. She runs, plays, mimics, feeds herself, babbles, has good receptive language skills but unable to converse back very well -- she's improving though.

Very difficult to determine if changes were result of normal childhood development or in part this program. In any event my little girl has progressed much the same as any small child.

My younger child was very limp at birth. E.I.P. helped strengthen his muscles. He wouldn't follow a ball from side to side, and they help him play games that work with his skills.

He's always been in the program, so wouldn't know any difference.

He's a lot more active than before, and does more things than he used to.

I have seen a lot of changes in my son and my family. My son does a lot of things that without this program I don't think that he would have been able to.

He has learned to talk more.

They show me how to handle his development, and how to give him motivation. He has learned quite quick at everything they show me.

He enjoys having people show him things. What he has learned from E.I.P. has helped him very much. He is happy about his visit and I think looks forward to the next one. He enjoys the games and toys the program has brought him.

He plays more and acts better than I thought he might without this program.

I have learned how to show him the right way to get him doing things faster, like sitting, crawling, walking, where to straighten his muscles, and how to get down to his level and play with him.

My son has learned how to do more things by himself, I have learned to guide him in certain areas and my family has enjoyed the program.

She seems to sit up more than before; claps her hands now; she helps herself up in a crawling position more often; she moves around the floor faster by pushing herself with her leg.

My child needs all the extra help right now. I find it really important while she is still young. I find the intervention worker also helps give me an extra boost when I feel down, and keeps me on my toes with the exercises.

Her motor skills are definately improving.

More confidence in our ability to help our daughter lead as normal a life as possible.

She has progressed at just about the same stages as a normal baby would have. Early Intervention helped to do this for our daughter.

As our daughter is only six months old, we cannot really see any effect at all.

We are much more aware of what to expect from our child.

Hard to tell as child was enrolled at birth.

Helped me to deal with her disability and to integrate her into the family.

Our child has learned to walk, run, etc. and does so with confidence -- much progress in a short period of time.

I am much less worried about his development and reassured about his physical and mental health.

I am more conscious of what activities are stimulating for my child. My child seems to be doing lots of different activities. My family feels lots of support.

Continuing to be very aware of his development and how to enhance it. My son is very happy to see our worker.

Our family has become closer, more tolerant, and less concerned with life's trivialities. We now focus on those things that really mean something in life.

Our child has developed to her greatest potential, reaching developmental milestones within an appropriate time frame. The value of having a professional work with your child and develop a long-term relationship with the parent and child is immense. The parent can identify the strengths and weaknesses of their child as identified by the worker who really knows your child, and has a relationship with the child and family.

Helped us initially to provide early intervention when we were perhaps still in the "shock" phase. Later on made us aware of the other programs available, e.g.

recreational swimming program and HANEN language program, both of which we found useful.

We are much more conscious of minute developmental accomplishments. We celebrate her successes.

Unfortunately not all the changes in our family were positive while being in the program. When you have a handicapped baby you go from being a competent parent to someone who needs "help" from a dozen professionals to raise your child. It makes you feel vulnerable, incompetent, and suddenly you are living in a fish bowl. I appreciated the home visits when my daughter was small and I didn't want to go out, but I prefer now to go out to obtain services.

We've always been in the program and her development is obviously progressing forward. She's now crawling, feeding herself, and starting to speak.

We are more aware of her abilities and notice more of her progress.

Child is becoming more independent and achieving skills; I am more accepting of our situation; sister is less jealous of the child.

Patience is more easily developed.

Gradual improvement in motor and speech skills.

Great progress has been made in social skills and playtime; as well speech has improved.

Improved vastly.

Has developed to her proper age level; she was one year behind at the beginning of the program.

Hard to say! I think it is fair to say that we likely wouldn't have coped quite as well with his disability, and it is possible he might not have developed as well.

Our child is doing well but it is difficult to say how much is directly attributable to Early Intervention.

Our worker has been with us since birth and we have no source for comparison.

We have watched him grow and develop very naturally even if delayed. I believe we are all much happier now having the additional guidance and knowledge from the Early Intervention workers.

I feel more confident, because of the support we have received, to be normal parents.

We have only been involved for a very short period of time, so it's hard to pin specific changes. I can say I feel more confident with myself and my job as a mother because of the support and positive feedback.

Appendix XXIV

Abridged Comments from Program Families

Please feel free to add further thoughts and comments.

If I had answered this questionnaire three months ago, I would have said I felt highly stressed almost always. We have had difficulties keeping a nanny, and I find it hard to manage my child in daycare as she gets sick so easily. I have recently made the decision to take a six month leave from work. Early Intervention was most useful in my child's infancy as this was a very stressful time where I had continual doctor's appointments. It was a relief to have the worker come to my home. Later when I returned to work the flexible schedule of the worker fit right into my schedule, whereas the hospital assessments require me to take time off work. Also my child was more relaxed in our home and was hysterical during hospital assessments (very stressful!). Now that I'm home and the child is more sociable, a more structured program involving more kids would be the best choice.

Our Early Intervention aide is on maternity leave and we currently have a replacement. She does not seem as qualified or experienced with Down Syndrome as our original worker. She spends a lot of time discussing her daughter's achievements rather than concentrating on what our daughter is doing.

I found the Early Intervention program to be most helpful. The staff, particularly the person working with us was very positive, gentle and effective. Both the support provided and the concrete suggestions they provided were greatly appreciated.

Down Syndrome is only a handicap if you believe it is.

The Early Intervention Program has helped me to understand my son's problem and helped our family to deal with emotions. This program has showed me a lot of changes in my son, and I do believe it will help overcome some of his problems. Without this program I do not believe I would have been able to handle this.

I am very happy with this program and the best thing that has happened is that my child is more active now and can sit all by himself now. I cannot think of any other way that this program can be improved and I could not be happier. I thank the staff (especially Deana who looks after my son) who has done a lot for me, my family and for my son.

I am interested in what other people think about the program. If you wish to use my name it is fine. I am proud of my son. The first year of life he went through a lot. I love him a lot. I have nothing to hide from anyone.

Our daughter is currently getting tested for her medical problems right now making it stressful. Once we know what's wrong with her we can find out whatever we have to do. We moved to Calgary for awhile until we can find out what is the matter with her. We have children aged 10, 9, and 7 who moved with us here. They miss their home in the country but try to understand. She has had surgery and will be having a muscle biopsy soon, which makes us nervous as we hate to see our daughter be in pain. So that's why all the stress. But we love her and feel it's worth it all.

My E.I.P. worker has been most friendly, compassionate, and helpful. I feel very comfortable with her. It is so nice to have someone come to us in our home. We see six different doctors and going to see them is always stressful for both of us (parent and child). Our E.I.P. worker really provided support. My husband and I are most grateful to her for helping us find respite care for our child, so that we can take a family holiday.

I wonder if you ever get over worrying about the future of a handicapped child. Ours is ten months old and I still cry weekly for him.

I hope that the E.I.P. could extend the program from three to six years, instead of having a two year gap from age three to school. I really appreciate what the program has done for me and only wish it could go a little longer. I think the E.I.P. is the best help for a parent who is willing to try and make their child the best he/she can be. The one on one concept is perfect for the child as well as the parents. All in all I really like the program and hope it will continue for the parents to be with handicapped children.

It seems my son just gets used to one worker and they leave. I think the office staff should consider the excellent work their field workers do. They help people learn to keep their children progressing.

Both myself and my husband do not feel we are dealing with "a special needs" child. We do feel sometimes his lack of speech causes unnecessary frustration (for both of us and our child), however this is only a small problem and we don't feel it will last for long.

I don't feel the data collected from this family is accurately portrayed for your needs, since I feel that my child does not rightfully fit under the category of a "special needs" child. I'm not saying my child does not need "special care" but his needs have not strained this family as would a child with a more severe illness.

The reason our family has been under a lot of emotional stress is due to a medical condition with our other child.

Our daughter was thought to have a very poor prognosis, but we never gave up hope thanks to our early intervention worker.

Our daughter seems bright and strong to us -- almost "normal". Are we just being overly optimistic or is she really not so far behind? We don't know. She's more a little person now and not so much the label of "Down Syndrome".

My child has not been in the program long enough to get any answers. My wife seems to think that my son is handicapped. As for me I don't think so. I would like to find out, but I don't know.

I think the in-home care is wonderful! Keep up the good work!

While my daughter's involvement in the E.I.P. was/is limited due to the need for more specialized services, the value of the program to me was high. The moral support by people who have at least some idea of the problems involved, and having someone go and find information, or even just having someone to talk to is invaluable. I can't suggest improvements for any part of the program I came in contact with, as it performed the services I required of it.

I am a very proud mother of my child. He makes me very happy in every way. I am only human so sometimes I do tend to get a little annoyed about what I was supposed to do, although I myself will never regret the day I gave birth to my son. Thank-you for your involvement with my son.

I am always very happy with my child, whether or not he is cranky or his father and I are arguing. I never seem to let the little things get in the way of my most important thing (that is my child).

I feel the intervention program is very important. When we weren't getting any help or support from the doctors and we were extremely worried about her development, the intervention program was there and they offered us support and made us feel we could help our child. They gave is a course of action to follow which decreased any stress we were feeling. I would hate to see the abolishement of this program.

Would it be possible to integrate programs for more than one child in the same family, i.e. in our case to get speech therapy for the older boy at the same time or within the same program as therapy to improve gross motor skills for the little girl?

My daughter was wanted and planned by myself with the full consent of her father (who does not live with us). Finding out that she is a Down Syndrome baby was a shock initially, and I cried myself to sleep twice at the hospital after her condition was confirmed. But I only had to see her face to know that the Down Syndrome didn't matter. She was mine and I very much wanted a child. She is my only child therefore I am not in a position nor do I have any experience of what is "normal" or what isn't. I have nothing to compare her to -- to me she is normal. I find her to be very alert, inquisitive, and intelligent. She "speaks" volumes and laughs with me constantly. I think she is a beautiful baby as do others as she gathers compliments wherever we go. I have no qualms about informing individuals of her condition. I am not ashamed. People tend to follow my lead and since I am so positive they react in the same manner. I try to educate people about Down Syndrome as much as possible without becoming too pushy.

Appendix XXV

Data File for Longitudinal Models

```
                                                                      MORE

List variables=all.

The VARIABLES are listed in the following order:

Line    1: CASE# FAMILY# PARENT PAR.AGE CULTURE RELIGION REL.CONV EDUCATN
           EMPLOYMT MARITAL CHILDSEX YOUNGSIB CAREGIVE CHI.AGE1 CHI.AGE2
           CHI.AGE3 HANDCAP1 HANDCAP2 HANDCAP3 STRESS1 STRESS2 STRESS3 MASTERY1
           MASTERY2 MASTERY3 MUTUAL1 MUTUAL2 MUTUAL3 FINSEC1 FINSEC2 FINSEC3
           PROBSOL1 PROBSOL2

Line    2: PROBSOL3 REFRAME1 REFRAME2 REFRAME3 ESCAPTV1 ESCAPTV2 ESCAPTV3
           RELYGOD1 RELYGOD2 RELYGOD3 DRINK1 DRINK2 DRINK3 FRIENDS1 FRIENDS2
           FRIENDS3 COUNSEL1 COUNSEL2 COUNSEL3 ACCOMP1 ACCOMP2 ACCOMP3 INTERST1
           INTERST2 INTERST3 RESTLES1 RESTLES2 RESTLES3 UPSET1 UPSET2 UPSET3
           PHYHLTH1 PHYHLTH2 PHYHLTH3 APPREC1

Line    3: APPREC2 APPREC3 ACCEPT1 ACCEPT2 ACCEPT3 DEMAND1 DEMAND2 DEMAND3
           COMPET1 COMPET2 COMPET3 ATTACH1 ATTACH2 ATTACH3 RESTRIC1 RESTRIC2
           RESTRIC3 DEPRESS1 DEPRESS2 DEPRESS3 CONFLCT1 CONFLCT2 CONFLCT3
           ISOLATN1 ISOLATN2 ISOLATN3 EIP DIAGNOS ENTRYAGE EIPMOS1 EIPMOS2
           EIPMOS3 PROGRES1

Line    4: PROGRES2 PROGRES3 HAPPYOC1 HAPPYOC2 HAPPYOC3 OTHERPGM
```

```
                                                                          MORE

   CASE#:   1 102 1 4 1 . 3 6 3 1 1 2 1 2 2 3 2 3 2 2 2 2 2 2 2 1 1 1 5 5 5 5 5
PROBSOL3: 5 5 5 5 1 1 1 1 2 2 1 1 1 5 5 4 4 3 3 4 2 4 4 3 4 2 1 1 2 1 1 2 . 4 4
 APPREC2: 2 4 2 4 2 2 2 2 4 4 4 2 4 4 2 4 2 2 2 2 2 2 2 4 4 4 1 1  1  0  4  9 7
PROGRES2: 3 8 4 3 4 6

   CASE#:   2 102 2 4 1 2 3 6 2 1 1 2 1 2 2 3 1 3 1 2 3 2 1 2 2 1 1 1 5 5 5 5 5
PROBSOL3: 5 5 4 5 1 1 1 2 1 2 1 1 1 4 3 4 2 2 2 4 4 4 4 4 4 2 2 2 2 2 2 4 5 4 4
 APPREC2: 5 4 1 2 2 2 2 2 4 4 4 4 2 2 2 2 2 1 2 1 1 2 2 4 4 4 1 1  0  0  6 10 .
PROGRES2: 3 4 4 4 4 6

   CASE#:   3 104 1 4 1 2 2 5 1 1 2 0 5 4 4 . 1 1 . 4 4 . 4 3 . 3 2 . 5 5 . 4 4
PROBSOL3: . 4 5 . 4 2 . 1 1 . 1 1 . 1 3 . 3 3 . 1 1 . 1 2 . 1 1 . 3 1 . 1 2 . 5
 APPREC2: 5 . 1 1 . 4 3 . 4 4 . 4 2 . 5 4 . 2 1 . 4 4 . 2 4 . 1 2  13 0  4  . .
PROGRES2: . . 5 . . 6

   CASE#:   4 104 2 4 1 2 2 4 1 1 2 0 5 4 4 . 1 1 . 3 3 . 3 2 . 2 2 . 5 5 . 4 4
PROBSOL3: . 4 4 . 4 4 . 1 1 . 2 1 . 1 1 . 2 3 . 3 4 . 3 4 . 4 4 . 1 3 . 4 4 . 4
 APPREC2: 5 . 3 5 . 2 3 . 5 5 . 5 5 . 4 5 . 2 2 . 4 4 . 3 4 . 1 2  13 0  4  . .
PROGRES2: . . 5 . . 1

   CASE#:   5 106 1 4 1 3 1 5 3 1 2 3 1 2 . . 2 . . 1 . . 1 . . 1 . . 5 . . 5 .
PROBSOL3: . 5 . . 2 . . 5 . . 1 . . 4 . . 1 . . 4 . . 4 . . 1 . . 2 . . 4 . . 3
 APPREC2: . . 2 . . 5 . . 5 . . 2 . . 4 . . 1 . . 1 . . 5 . . 1 2  3  1  .  . 3
```

```
                                                                MORE
PROGRES2: . . 4 . . 3

   CASE#:   6 106 2 4 1 3 1 6 1 1 2 3 1 2 . . 2 . . 1 . . 2 . . 1 . . 5 . . 5 .
PROBSOL3: . 5 . . 2 . . 5 . . 1 . . 4 . . 1 . . 4 . . 4 . . 1 . . 1 . . 5 . . 5
 APPREC2: . . 2 . . 4 . . 5 . . 2 . . 2 . . 1 . . 1 . . 5 . . 1 2  3  2  .  . 5
PROGRES2: . . 5 . . 3

   CASE#:   7 107 1 4 1 1 3 6 3 1 2 0 1 2 3 . 1 1 . 3 2 . 3 1 . 1 1 . 5 5 . 3 5
PROBSOL3: . 5 5 . 1 2 . 2 3 . 2 2 . 5 4 . 2 1 . 3 4 . 2 3 . 2 5 . 1 1 . 5 2 . 5
 APPREC2: 5 . 1 1 . 1 3 . 4 4 . 5 2 . 4 2 . 2 3 . 1 1 . 5 5 . 1 1  3  2  9  . 1
PROGRES2: 2 . 4 4 . 2

   CASE#:   8 107 2 4 1 . 2 6 3 1 2 0 1 2 3 . 1 1 . 2 3 . 1 2 . 1 1 . 5 5 . 5 5
PROBSOL3: . 5 5 . 1 1 . 1 1 . 3 3 . 4 3 . 1 1 . 3 4 . 3 4 . 3 5 . 1 1 . 3 3 . 4
 APPREC2: 3 . 3 1 . 1 3 . 5 5 . 5 5 . 1 2 . 1 1 . 1 1 . 5 5 . 1 1  3  2  9  . 3
PROGRES2: 3 . 5 5 . 2

   CASE#:   9 108 1 4 1 1 3 3 1 1 1 0 2 1 3 . 2 2 . 1 2 . 1 2 . 1 1 . 5 5 . 5 5
PROBSOL3: . 4 5 . 1 1 . 1 1 . 1 1 . 3 3 . 1 1 . 4 4 . 3 4 . 4 5 . 1 1 . 4 5 . 4
 APPREC2: 5 . 1 1 . 1 1 . 5 5 . 3 . . 1 4 . 1 1 . 1 1 . 5 5 . 1 1  0  0  4  . .
PROGRES2: 1 . 5 5 . 3

   CASE#:  10 108 2 4 1 1 3 5 1 1 1 0 2 1 3 . 1 1 . 1 2 . 2 2 . 1 1 . 5 5 . 5 5
PROBSOL3: . 4 5 . 1 2 . 1 5 . 1 1 . 4 5 . 1 1 . 4 4 . 4 4 . 2 2 . 1 2 . 4 4 . 5
```

```
                                                                       MORE
  APPREC2: 4 . 1 1 . 1 1 . 5 5 . 3 4 . 2 4 . 1 2 . 1 1 . 1 4 . 1 1  0  0  4   . .
 PROGRES2: 1 . 5 5 . 3

    CASE#:  11  112 1 4 1 2 3 4 1 1 2 1 1 3 . . 2 . . 3 . . 1 . . 1 . . 5 . . 5 .
 PROBSOL3: . 5 . . 2 . . 1 . . 1 . . 5 . . 1 . . 4 . . 5 . . 2 . . 1 . . 2 . . 5
  APPREC2: . . 1 . . 1 . . 5 . . 1 . . 1 . . 1 . . 1 . . 4 . . 1 2  6  1   .  . 5
 PROGRES2: . . 5 . . 0

    CASE#:  12  112 2 4 1 1 2 3 1 1 2 1 1 3 . . 2 . . . . . . 3 . . 3 . . 2 . . 5 .
 PROBSOL3: . 5 . . 4 . . 3 . . 3 . . 2 . . 1 . . 5 . . 4 . . 3 . . 3 . . 4 . . 4
  APPREC2: . . 4 . . 4 . . 5 . . 3 . . 3 . . 3 . . 4 . . 2 . . 1 2  6  1   .  . .
 PROGRES2: . . 5 . . 0

    CASE#:  13  114 3 3 1 2 1 3 3 1 2 1 1 2 3 . 1 1 . 2 2 . 2 2 . 1 1 . 4 3 . 5 5
 PROBSOL3: . 5 5 . 1 2 . 5 5 . 1 1 . 4 4 . 1 2 . 2 3 . 2 5 . 1 1 . 1 1 . 4 4 . 3
  APPREC2: 3 . 2 1 . 1 1 . 5 5 . 4 4 . 2 2 . 1 1 . 1 1 . 5 5 . 1 1  1  1  8   . 1
 PROGRES2: 1 . 5 5 . 3                     -

    CASE#:  14  114 4 3 1 2 1 3 1 1 2 0 1 2 . . 1 . . 2 . . 1 . . 1 . . 4 . . 5 .
 PROBSOL3: . 5 . . 2 . . 5 . . 1 . . 4 . . 1 . . 3 . . 3 . . 3 . . 2 . . 5 . . 3
  APPREC2: . . 1 . . 3 . . 5 . . 4 . . 2 . . 1 . . 1 . . 5 . . 1 1  1  1   .  . 3
 PROGRES2: . . 5 . . 1

    CASE#:  15  125 1 2 1 4 2 4 2 2 1 0 1 5 6 . 3 1 . 2 3 . 2 2 . 3 2 . 5 4 . 4 4
```

```
                                                                         MORE
PROBSOL3: . 4 4 . 1 1 . 1 1 . 1 1 . 4 3 . 3 2 . 4 3 . 4 4 . 2 2 . 3 3 . 4 4 . 4
 APPREC2: 4 . 3 4 . 1 2 . 5 5 . 5 4 . 3 3 . 1 1 . 2 3 . 4 4 . 1 2 21  0  6  . 4
PROGRES2: 6 . 4 4 . 1

   CASE#:  16 125 2 2 1 4 2 3 1 2 1 0 1 5 6 . 2 2 . 2 3 . 1 2 . 1 2 . 1 2 . . 3
PROBSOL3: . 5 4 . 3 2 . 1 1 . 1 3 . 5 5 . 1 1 . 3 4 . 3 3 . 5 5 . 2 3 . 4 4 . 5
 APPREC2: 5 . 3 2 . 2 3 . 5 5 . 3 3 . 4 5 . 1 1 . 3 4 . 5 5 . 1 2 21  0  6  . .
PROGRES2: 5 . 5 5 . 0

   CASE#:  17 127 2 5 3 1 1 5 1 2 1 0 3 2 3 . 2 3 . 2 1 . 1 1 . 1 1 . 5 5 . 5 5
PROBSOL3: . . 5 . . 3 . . 4 . . 1 . . 1 . 4 3 . 4 5 . . 4 . . 1 . . 2 . 4 5 . 4
 APPREC2: 5 . 1 2 . 1 1 . 4 5 . 4 5 . 1 2 . 1 1 . 1 1 . 4 3 . 1 1  1  2  7  . 1
PROGRES2: 1 . 5 5 . 0

   CASE#:  18 130 1 2 1 2 3 4 3 3 2 0 1 2 3 . 2 3 . 5 3 . 3 2 . 4 1 . 3 4 . 1 5
PROBSOL3: . 1 3 . 3 2 . 3 4 . 1 1 . 5 5 . 1 . . 2 1 . 3 5 . 4 1 . 5 3 . 2 4 . 5
 APPREC2: 5 . 2 2 . 1 1 . 5 5 . 5 5 . 2 2 . 1 1 . 1 1 . 5 5 . 1 2  3  2  6  . 1
PROGRES2: 1 . 5 5 . 4

   CASE#:  19 132 1 4 1 2 3 6 3 1 1 1 1 4 5 . 3 2 . 3 3 . 1 2 . 1 1 . 5 5 . 5 4
PROBSOL3: . 5 4 . 1 1 . 1 2 . 1 1 . 5 4 . 2 2 . 4 4 . 3 4 . 1 2 . 2 2 . 4 4 . 4
 APPREC2: 4 . 1 1 . 1 1 . 5 5 . 4 5 . 2 2 . 1 1 . 1 1 . 5 5 . 1 2 12  3  8  . 3
PROGRES2: . . 5 4 . 3
```

```
                                                                         MORE
   CASE#:  20 132 2 4 1 1 2 6 1 1 1 1 1 4 5 . 3 3 . 2 2 . 1 1 . 1 1 . 5 1 . 4 5
PROBSOL3: . 4 4 . 3 2 . 1 1 . 1 1 . 2 3 . 1 1 . 4 4 . 5 5 . 4 4 . 2 3 . 5 4 . 5
 APPREC2: 4 . 2 1 . 1 1 . 5 5 . 4 5 . 1 1 . 1 1 . 1 1 . 5 4 . 1 2 12  3  8  . .
PROGRES2: . . 5 . . .

   CASE#:  21 133 1 4 3 1 3 6 2 2 2 0 1 2 2 . 2 2 . 2 3 . 3 3 . 2 3 . 2 3 . 3 3
PROBSOL3: . 4 5 . 2 2 . 3 5 . 1 2 . 2 2 . 3 3 . 4 5 . 3 3 . 1 2 . 2 2 . 5 4 . 5
 APPREC2: 4 . 3 2 . 2 1 . 5 5 . 3 4 . 4 4 . 2 2 . 2 1 . 5 4 . 1 1  2  0  4  . 1
PROGRES2: 1 . 5 5 . 4

   CASE#:  22 133 2 5 4 5 3 5 1 4 2 0 1 2 2 . 2 2 . 2 3 . 3 3 . 3 3 . 3 3 . 3 3
PROBSOL3: . 5 5 . 1 1 . 5 5 . 1 1 . 3 1 . 3 5 . 3 3 . 5 3 . 3 1 . 2 1 . 5 5 . 4
 APPREC2: 4 . 2 2 . 2 2 . 4 4 . 4 4 . 4 4 . 2 2 . 2 2 . 4 4 . 1 1  2  0  4  . 1
PROGRES2: 2 . 5 5 . 2

   CASE#:  23 134 1 4 1 1 3 6 1 1 1 1 3 4 4 . 3 3 . 3 3 . 2 2 . 1 1 . 5 5 . 5 5
PROBSOL3: . 5 4 . 2 3 . 3 2 . 2 1 . 4 3 . . 1 . 3 4 . 3 4 . 2 3 . 1 2 . 4 4 . 3
 APPREC2: 4 . 2 2 . 1 1 . 5 5 . 3 2 . 2 2 . 3 1 . 1 1 . 4 4 . 1 2 13  0  2  . 3
PROGRES2: 4 . 4 5 . 2

   CASE#:  24 134 2 4 1 1 1 6 1 1 1 1 3 4 4 . 3 3 . 2 1 . 2 1 . 1 1 . 5 5 . 5 5
PROBSOL3: . 4 3 . 1 1 . 3 3 . 1 1 . 3 4 . 2 3 . 4 4 . 4 4 . 2 3 . 2 2 . 5 5 . 4
 APPREC2: 4 . 2 2 . 2 2 . 5 5 . 2 4 . 2 2 . 2 1 . 1 1 . 4 4 . 1 2 13  0  2  . 3
PROGRES2: 5 . 4 5 . 2
```

```
                                                                    MORE

   CASE#:  25 136 1 4 1 2 3 6 3 1 2 1 1 2 . . 1 . . 3 . . 1 . . 1 . . 5 . . 5 .
PROBSOL3: . 5 . . 2 . . 3 . . 1 . . 4 . . 1 . . 5 . . 5 . . 3 . . 1 . . 5 . . 5
 APPREC2: . . 2 . . 2 . . 5 . . 4 . . 4 . . 1 . . 2 . . 5 . . 1 1  2  1  .  . 2
PROGRES2: . . 5 . . 1

   CASE#:  26 136 2 4 1 . . 6 1 1 2 1 1 2 . . 1 . . 3 . . 2 . . 1 . . 4 . . 5 .
PROBSOL3: . 5 . . 1 . . 1 . . 1 . . 3 . . 1 . . 3 . . 3 . . 3 . . 1 . . 2 . . 5
 APPREC2: . . 1 . . 1 . . 4 . . 3 . . 1 . . 1 . . 1 . . 5 . . 1 1  3  0  .  . .
PROGRES2: . . 5 . . 1

   CASE#:  27 139 1 4 1 2 2 3 3 3 2 0 1 5 . . 1 . . 4 . . 4 . . 4 . . 3 . . 3 .
PROBSOL3: . 4 . . 4 . . 1 . . 5 . . 4 . . 3 . . 3 . . 3 . . 1 . . 4 . . 2 . . 5
 APPREC2: . . 4 . . 4 . . 5 . . 5 . . 5 . . 4 . . 3 . . 1 . . 1 2  9  1  .  . 4
PROGRES2: . . 4 . . 3

   CASE#:  28 148 1 3 1 1 2 4 4 2 1 0 1 2 . . . . . . 3 . . 3 . . 4 . . 3 . . 5 .
PROBSOL3: . 5 . . 2 . . 3 . . 1 . . 3 . . 1 . . 4 . . 4 . . 1 . . 1 . . 5 . . 5
 APPREC2: . . 1 . . 1 . . 5 . . 5 . . 2 . . 1 . . 1 . . 5 . . 1 1  2  1  .  . 1
PROGRES2: . . 5 . . 1

   CASE#:  29 182 1 4 1 2 3 5 3 4 2 0 1 7 . . 3 . . 3 . . 3 . . 5 . . 5 . . 5 .
PROBSOL3: . 3 . . 2 . . 4 . . 1 . . 4 . . 5 . . 4 . . 4 . . 3 . . 2 . . 4 . . 5
 APPREC2: . . 4 . . 3 . . 5 . . 5 . . 3 . . 1 . . 1 . . 4 . . 1 2 30  2  .  . 2
```

```
                                                                    MORE
PROGRES2: . . 4 . . 2

   CASE#:  30 183 1 3 1 4 2 6 3 1 2 1 1 3 . . 3 . . 3 . . 1 . . 1 . . 5 . . 4 .
PROBSOL3: . 3 . . 1 . . 1 . . 1 . . 4 . . 1 . . 3 . . 4 . . 1 . . 1 . . 4 . . 4
 APPREC2: . . 4 . . 1 . . 5 . . 5 . . 1 . . 1 . . 1 . . 5 . . 1 2  6  0   .  . .
PROGRES2: . . 4 . . 0

   CASE#:  31 183 2 3 1 4 2 4 1 1 2 1 1 3 . . 2 . . 3 . . 2 . . 1 . . 5 . . 5 .
PROBSOL3: . 5 . . 1 . . 1 . . 1 . . 3 . . 2 . . 3 . . 3 . . 2 . . 3 . . 5 . . 4
 APPREC2: . . 3 . . 2 . . 5 . . 4 . . 2 . . 2 . . 2 . . 4 . . 1 2  7  1   .   . 4
PROGRES2: . . 5 . . 1

   CASE#:  32 189 1 4 1 . 2 6 3 1 1 1 1 2 . . 2 . . 2 . . 1 . . 1 . . 4 . . 5 .
PROBSOL3: . 3 . . 1 . . 1 . . 1 . . 5 . . 3 . . 4 . . 3 . . 1 . . 1 . . 5 . . 5
 APPREC2: . . 1 . . 1 . . 5 . . 5 . . 2 . . 2 . . 2 . . 4 . . 1 1  2  1   .   . 1
PROGRES2: . . 5 . . 0

   CASE#:  33 189 2 4 1 . 2 5 1 1 1 1 1 2 . . 2 . . 2 . . 1 . . 1 . . 4 . . 5 .
PROBSOL3: . 3 . . 1 . . 1 . . 1 . . 5 . . 3 . . 5 . . 5 . . 1 . . 1 . . 4 . . 5
 APPREC2: . . 1 . . 1 . . 5 . . 5 . . 1 . . 1 . . 1 . . 5 . . 1 1  3  1   .  . .
PROGRES2: . . 5 . . 3

   CASE#:  34 201 1 3 1 2 1 5 3 1 1 1 1 4 5 5 1 1 1 . 2 1 1 1 2 1 1 1 3 3 3 5 4
PROBSOL3: 4 5 4 3 2 4 2 5 4 4 1 1 1 4 4 4 1 1 1 3 2 3 3 3 4 1 1 1 1 1 1 4 . 4 4
```

```
                                                                      MORE
 APPREC2: 4 4 2 4 2 2 2 2 5 4 5 5 4 3 3 3 4 2 1 2 2 2 2 4 4 4 2 2  3 12 16 20 3
PROGRES2: 5 4 4 4 4 5

   CASE#:  35 202 1 4 1 2 3 6 1 1 2 1 3 2 3 . 1 1 . . 3 . 4 3 . 1 1 . 5 5 . 5 5
PROBSOL3: . 4 3 . 1 2 . 1 2 . 1 2 . 2 3 . 2 1 . 4 4 . 3 3 . 3 2 . 2 1 . 4 4 . 4
 APPREC2: 4 . 4 3 . 4 3 . 3 4 . 3 3 . 3 2 . 3 2 . 2 2 . 4 4 . 2 2  3  3  7  . 2
PROGRES2: 5 . 4 4 . 5

   CASE#:  36 203 1 3 1 4 . 2 3 1 1 1 1 5 . . 1 . . 3 . . 2 . . 3 . . 4 . . 5 .
PROBSOL3: . 5 . . 3 . . 1 . . 1 . . 5 . . 1 . . 4 . . 4 . . 1 . . 1 . . 4 . . 5
 APPREC2: . . 2 . . 1 . . 5 . . 4 . . 1 . . 1 . . 2 . . 5 . . 2 1  2 18  .   . 1
PROGRES2: . . 5 . . 1

   CASE#:  37 203 2 4 1 . 2 2 1 1 1 1 1 5 . . 3 . . 2 . . 3 . . 2 . . 3 . . 4 .
PROBSOL3: . 4 . . 2 . . 1 . . 2 . . 1 . . 1 . . 3 . . 3 . . 2 . . 1 . . 4 . . 4
 APPREC2: . . 2 . . 1 . . 4 . . 4 . . 2 . . 2 . . 2 . . 4 . . 2 1  2 18  .   . 2
PROGRES2: . . 5 . . 1

   CASE#:  38 204 1 2 1 1 2 4 1 3 2 3 1 6 7 7 3 3 3 2 1 1 1 1 1 1 1 5 5 5 5 5
PROBSOL3: 5 5 5 5 1 1 1 1 1 1 1 1 1 3 3 3 1 1 1 4 3 3 4 3 3 3 4 5 2 1 3 4 5 5 4
 APPREC2: 5 5 4 4 4 1 1 1 5 5 5 2 1 1 2 1 1 1 1 1 1 1 4 5 5 2 1  2 24 28 33 1
PROGRES2: 1 2 5 5 5 4

   CASE#:  39 204 2 4 1 2 2 4 1 3 2 3 1 6 7 7 . 3 3 2 1 1 3 1 1 . 1 1 . 3 1 5 5
```

```
                                                                MORE
PROBSOL3: 5 . 3 5 . 1 1 . 1 1 . 1 1 . 1 3 . 1 1 . 5 5 . 4 4 . 5 5 . 2 2 4 4 5 4
 APPREC2: 4 5 2 2 4 2 2 1 4 4 5 3 2 1 2 2 1 2 2 1 3 2 1 4 4 5 2 1  2 24 28 33 1
PROGRES2: 1 2 5 5 5 4

   CASE#:  40 205 1 3 1 . 2 5 3 1 2 1 1 7 8 8 3 3 3 1 3 4 1 2 1 1 1 1 4 2 3 5 4
PROBSOL3: 5 5 4 4 1 2 2 1 1 1 1 1 1 3 2 3 1 1 1 5 4 4 5 4 4 1 4 3 1 4 1 5 3 4 5
 APPREC2: 5 5 1 2 1 1 1 1 5 5 5 5 4 3 1 3 1 1 1 1 1 1 1 5 5 5 2 2 29  3  9 12 3
PROGRES2: 1 2 4 4 5 4

   CASE#:  41 205 2 4 1 . 2 6 1 1 2 1 1 7 8 8 3 3 3 2 3 4 1 2 2 1 2 2 4 3 3 5 5
PROBSOL3: 5 5 5 5 2 3 3 1 1 1 1 2 2 4 3 2 1 1 1 4 4 4 4 4 3 3 3 3 2 3 2 5 5 4 4
 APPREC2: 5 5 5 2 1 1 1 1 5 5 5 5 4 4 1 2 1 1 1 1 1 1 1 4 5 5 2 2 29  3  9 12 4
PROGRES2: 3 1 5 5 5 3

   CASE#:  42 206 3 5 1 3 1 4 3 1 . 1 1 6 . . 1 . . 1 . . 1 . . 1 . . 3 . . 5 .
PROBSOL3: . 5 . . 3 . . 5 . . 1 . . 4 . . 1 . . 5 . . 4 . . 3 . . 1 . . 4 . . 3
 APPREC2: . . 4 . . 5 . . 5 . . 5 . . 4 . . 5 . . 1 . . 5 . . 2 2  6 21  .  . 1
PROGRES2: . . 5 . . 1

   CASE#:  43 207 1 2 1 . 2 3 3 1 2 0 1 7 . . 3 . . 1 . . 4 . . 3 . . 2 . . 3 .
PROBSOL3: . 3 . . 4 . . 1 . . 1 . . 4 . . 1 . . 3 . . 3 . . 2 . . 2 . . 4 . . 4
 APPREC2: . . 5 . . 2 . . 5 . . 5 . . 3 . . 2 . . 1 . . 3 . . 2 1  3 30  .  . 3
PROGRES2: . . 4 . . 1
```

```
                                                                   MORE
   CASE#:  44 207 2 4 1 . 2 2 1 1 2 0 1 6 . . 3 . . 2 . . 3 . . 1 . . 1 . . 2 .
PROBSOL3: . 3 . . 1 . . 1 . . 1 . . 1 . . 1 . . 2 . . 1 . . 1 . . 1 . . 4 . . 4
 APPREC2: . . 4 . . 2 . . 4 . . 5 . . 2 . . 2 . . 2 . . 4 . . 2 1  3 26  .  . 3
PROGRES2: . . 5 . . 1

   CASE#:  45 209 1 4 1 2 3 5 3 1 1 1 1 4 5 6 2 2 2 2 1 3 1 1 1 2 1 3 5 5 4 5 5
PROBSOL3: 5 4 4 4 1 2 2 4 2 2 1 1 1 4 2 3 2 1 2 4 4 4 4 4 4 1 1 2 2 1 2 4 5 4 5
 APPREC2: 5 4 1 1 1 1 1 2 5 5 5 4 5 5 1 1 2 1 1 1 1 1 2 4 5 5 2 2  3 15 18 22 2
PROGRES2: 2 2 5 5 5 4

   CASE#:  46 213 1 2 1 . 2 2 4 2 2 1 1 4 . . 3 . . 1 . . 3 . . 1 . . 1 . . . .
PROBSOL3: . . . . . . . . . . . . . 3 . . . . . 2 . . . . . . . . . . . 4 . . 3
 APPREC2: . . 2 . . 4 . . 5 . . 5 . . 4 . . 1 . . 1 . . 2 . . 2 2  2 14  .  . 2
PROGRES2: . . 3 . . 2

   CASE#:  47 214 1 2 1 2 3 2 2 1 2 0 2 3 . . 3 . . 2 . . 1 . . 3 . . 3 . . 5 .
PROBSOL3: . 5 . . 2 . . 1 . . 1 . . 3 . . 1 . . 4 . . 2 . . 3 . . 3 . . 3 . . 5
 APPREC2: . . 2 . . 1 . . 5 . . 4 . . 2 . . . . . 1 . . 4 . . 2 1  1 11  .  . 1
PROGRES2: . . 5 . . 0

   CASE#:  48 214 2 2 1 2 3 4 1 1 2 0 2 3 . . 3 . . 2 . . 2 . . 3 . . 4 . . 4 .
PROBSOL3: . 5 . . 2 . . 1 . . 1 . . 2 . . 1 . . 3 . . 4 . . 3 . . 3 . . 4 . . 4
 APPREC2: . . 1 . . 1 . . 5 . . 4 . . 2 . . 1 . . 1 . . 5 . . 2 1  1 11  .  . 4
PROGRES2: . . 5 . . 0
```

```
                                                                   MORE

   CASE#:  49 215 1 3 4 6 1 3 2 1 2 1 2 4 5 . 2 2 . 2 2 . 1 1 . 1 2 . 5 5 . 5 5
PROBSOL3: . 4 5 . 2 1 . 3 2 . 1 1 . 3 3 . 1 1 . 5 4 . 4 3 . 1 1 . 3 2 . 5 5 . 5
 APPREC2: 5 . 2 4 . 1 2 . 5 5 . 5 5 . 5 . . 1 3 . 1 1 . 5 5 . 2 2  2 13 18  . 1
PROGRES2: 1 . 5 5 . 0

   CASE#:  50 215 2 4 4 6 1 3 1 1 2 1 2 4 . . 2 . . 2 . . 1 . . 1 . . 5 . . 5 .
PROBSOL3: . 4 . . 2 . . 3 . . 1 . . 3 . . 1 . . 5 . . 4 . . 1 . . 3 . . 5 . . 5
 APPREC2: . . 2 . . 1 . . 5 . . 5 . . 5 . . 1 . . 1 . . 5 . . 2 2  2 13 .   . 1
PROGRES2: . . 5 . . 0

   CASE#:  51 217 1 3 1 2 3 2 3 1 2 0 1 6 6 . 3 3 . 3 4 . 2 4 . 1 2 . 3 3 . 2 4
PROBSOL3: . 4 5 . 4 2 . 3 3 . 2 1 . 3 3 . 1 1 . 5 5 . 3 3 . 2 2 . 2 3 . 3 4 . 5
 APPREC2: 5 . 2 2 . 2 1 . 5 5 . 5 4 . 2 3 . 1 3 . 1 1 . 5 5 . 2 2 11 16 20  . 1
PROGRES2: 1 . 4 4 . 2

   CASE#:  52 217 2 4 1 1 3 4 1 1 2 0 1 6 6 . 3 2 . 2 2 . 2 1 . 1 2 . 3 5 . 5 5
PROBSOL3: . 5 5 . 2 3 . 2 3 . 2 3 . 5 3 . 1 1 . 4 2 . 4 4 . 4 3 . 1 2 . 4 4 . 5
 APPREC2: 5 . 2 2 . 2 2 . 5 4 . 4 4 . 3 2 . 2 2 . 1 2 . 5 4 . 2 2 11 16 20  . 2
PROGRES2: 3 . 5 4 . 2

   CASE#:  53 218 1 4 1 2 1 3 5 5 2 1 1 5 . . 3 . . 1 . . 1 . . 1 . . 3 . . 4 .
PROBSOL3: . 3 . . 3 . . 4 . . 1 . . 2 . . 1 . . 5 . . 4 . . 1 . . 2 . . 4 . . 4
 APPREC2: . . 1 . . 1 . . 5 . . 5 . . 2 . . 2 . . 1 . . 4 . . 2 2 10 11 .   . 1
```

```
                                                                        MORE
PROGRES2: . . 4 . . 2

   CASE#:  54 219 1 3 2 1 3 2 3 1 1 0 1 6 . . 2 . . . . . 4 . . 4 . . 4 . . 2 .
PROBSOL3: . 5 . . 2 . . 5 . . . . . . . . . 2 . . 3 . . 2 . . 3 . . 3 . . . . . 4
 APPREC2: . . 5 . . 3 . . 5 . . 5 . . 5 . . 4 . . 5 . . 4 . . 2 2 21  6  .  . 3
PROGRES2: . . 2 . . 2

   CASE#:  55 219 2 . 2 1 1 5 . 1 1 0 1 6 . . 1 . . 4 . . 5 . . 3 . . 1 . . 3 .
PROBSOL3: . 4 . . 3 . . 5 . . 1 . . 4 . . 1 . . 4 . . 5 . . 3 . . 3 . . 4 . . 5
 APPREC2: . . 2 . . 4 . . 5 . . 5 . . 4 . . 2 . . 4 . . 4 . . 2 2 21  6  .  . 4
PROGRES2: . . 3 . . .

   CASE#:  56 221 1 3 1 7 1 5 3 1 1 1 1 3 4 . 1 1 . 4 3 . 2 1 . 2 2 . 4 5 . 4 4
PROBSOL3: . 3 2 . 2 1 . 5 5 . 1 1 . 5 4 . 1 1 . 5 4 . 4 3 . 2 2 . 2 2 . 2 2 . 4
 APPREC2: 4 . 3 2 . 4 5 . 4 4 . 5 5 . 5 4 . 3 3 . 4 4 . 4 4 . 2 2  7  2  7  . 4
PROGRES2: 3 . 4 5 . 4

   CASE#:  57 221 2 3 1 7 1 6 1 1 1 1 1 3 . . 1 . . 3 . . 2 . . 2 . . 4 . . 3 .
PROBSOL3: . 4 . . 1 . . 5 . . 1 . . 3 . . 1 . . 4 . . 4 . . 1 . . 1 . . 4 . . 4
 APPREC2: . . 2 . . 4 . . 5 . . 3 . . 2 . . 1 . . 3 . . 4 . . 2 2  8  2  .  . 3
PROGRES2: . . 5 . . 2

   CASE#:  58 223 1 4 1 2 3 6 1 1 1 0 4 2 3 . 1 3 . 3 2 . 3 2 . 1 1 . 5 4 . 5 5
PROBSOL3: . 3 3 . 1 2 . 2 3 . 1 2 . 3 2 . 1 1 . 4 4 . 4 4 . 1 4 . 2 2 . 5 4 . 5
```

```
                                                               MORE
  APPREC2: 4 . 2 2 . 2 3 . 5 5 . 5 4 . 4 3 . 2 2 . 2 3 . 4 5 . 2 1  2  3  6   . 2
 PROGRES2: 3 . 5 4 . 3

    CASE#:  59 223 2 3 1 2 3 6 1 1 1 0 4 2 3 . 1 1 . 2 3 . 2 1 . 2 1 . 5 5 . 5 5
 PROBSOL3: . 4 5 : 3 2 . 2 2 . 1 2 . 3 3 . 3 1 . 4 4 . 4 4 . 2 3 . 2 3 . 5 4 . 4
  APPREC2: 4 . 2 2 . 1 3 . 4 5 . 2 4 . 2 4 . 2 2 . 1 5 . 4 4 . 2 1  2  3  6   . 2
 PROGRES2: 4 . 4 4 . 1

    CASE#:  60 222 1 4 1 1 . 3 3 1 2 0 1 3 . . 3 . . 2 . . . . . . . . 5 . . 5 .
 PROBSOL3: . 5 . . 3 . . 3 . . 1 . . 2 . . 1 . . 3 . . 3 . . 1 . . 3 . . . . . 4
  APPREC2: . . 4 . . 3 . . 4 . . 4 . . 2 . . 1 . . 1 . . 4 . . 2 1  1 10   .   . 6
 PROGRES2: . . 3 . . .

    CASE#:  61 224 1 4 1 2 2 6 1 1 1 1 3 2 3 4 1 1 1 3 3 2 2 2 3 2 1 2 5 4 5 3 3
 PROBSOL3: 4 4 3 4 1 1 1 1 1 1 2 2 2 2 3 2 1 2 1 3 3 3 2 3 4 1 1 1 1 2 2 4 4 5 .
  APPREC2: 4 4 4 4 4 2 3 4 3 4 4 . 4 3 4 3 2 4 4 2 2 2 2 4 4 4 2 1  2   4   9 14 3
 PROGRES2: 4 5 4 3 4 4

    CASE#:  62 224 2 4 1 1 3 2 1 1 1 1 3 2 3 4 1 1 1 3 3 2 2 3 2 1 1 1 5 3 1 4 4
 PROBSOL3: . 3 3 . 3 2 2 2 1 2 1 2 1 3 3 3 1 1 1 2 3 4 3 3 3 1 1 2 2 2 2 4 4 4 4
  APPREC2: 4 4 1 4 2 2 3 4 5 4 5 3 3 4 3 3 2 1 2 1 1 2 1 5 4 4 2 1  2   4   9 14 .
 PROGRES2: 4 3 5 3 5 4

    CASE#:  63 225 1 4 1 1 1 5 3 1 1 0 1 3 . . 3 . . 1 . . 2 . . 2 . . 5 . . 5 .
```

```
                                                                  MORE
PROBSOL3: . 5 . . 2 . . 5 . . 2 . . 4 . . 1 . . 4 . . 4 . . 1 . . 3 . . 5 . . 5
 APPREC2: . . 1 . . 1 . . 5 . . 5 . . 4 . . 2 . . 1 . . 5 . . 2 1  0  6  .  . 1
PROGRES2: . . 5 . . 1

   CASE#:  64 225 2 4 1 1 1 2 1 1 1 0 1 3 . . 2 . . 3 . . 3 . . 2 . . 5 . . 5 .
PROBSOL3: . 5 . . 3 . . 5 . . 3 . . 3 . . 1 . . 5 . . 4 . . 1 . . 3 . . 4 . . 4
 APPREC2: . . 2 . . 2 . . 5 . . 3 . . 2 . . 1 . . 1 . . 4 . . 2 1  0  6  .  . 1
PROGRES2: . . 5 . . 1

   CASE#:  65 229 1 4 1 1 3 6 1 1 2 1 3 5 . . 3 . . 2 . . 2 . . 1 . . 5 . . 5 .
PROBSOL3: . 4 . . 2 . . 3 . . 2 . . 4 . . 4 . . 4 . . 4 . . 3 . . 2 . . 4 . . 5
 APPREC2: . . 3 . . 1 . . 5 . . 2 . . 4 . . 1 . . 2 . . 5 . . 2 2 15  6  .  . 1
PROGRES2: . . 5 . . 0

   CASE#:  66 229 2 4 1 1 2 6 1 1 2 1 3 5 . . 3 . . 2 . . 1 . . 1 . . 5 . . 5 .
PROBSOL3: . 4 . . 2 . . 2 . . 2 . . 4 . . 3 . . 4 . . 4 . . 3 . . 2 . . 2 . . 4
 APPREC2: . . 2 . . 5 . . 5 . . 2 . . 2 . . 5 . . 2 . . 4 . . 2 2 15  6  .  . 1
PROGRES2: . . 5 . . 0

   CASE#:  67 230 1 4 1 1 1 6 2 1 2 0 5 5 6 7 3 3 3 3 2 2 2 2 3 3 3 3 5 5 5 5 5
PROBSOL3: 5 4 4 3 3 1 2 2 2 1 1 1 2 3 2 . 1 3 2 2 4 4 2 4 4 3 1 1 1 2 1 5 2 2 5
 APPREC2: 5 5 2 5 2 2 1 2 5 5 5 5 4 5 5 5 5 2 1 1 4 4 4 4 4 5 2 2  1  5 10 12 2
PROGRES2: 1 1 4 4 4 5
```

```
                                                                     MORE
   CASE#:  68 230 2 4 1 . 2 5 1 1 2 0 5 5 6 7 3 3 3 4 3 2 4 2 2 4 3 2 5 5 4 2 4
PROBSOL3: 3 2 3 2 3 2 3 . 1 1 1 2 1 3 4 3 1 . 3 4 4 3 3 3 3 1 1 1 5 4 4 4 5 . 5
 APPREC2: 5 4 2 4 2 3 4 3 5 3 4 5 4 4 4 3 2 2 2 2 2 2 2 4 4 4 2 2  1  5 10 12 4
PROGRES2: . . 5 . . .

   CASE#:  69 231 1 4 1 1 1 6 2 1 1 1 5 5 6 . 1 1 . 2 3 . 2 1 . 1 1 . 5 5 . 5 5
PROBSOL3: . 5 5 . 1 1 . 3 4 . 1 1 . 5 4 . 1 1 . 4 5 . 4 5 . 1 1 . 2 1 . 4 4 . 4
 APPREC2: 4 . 1 1 . 1 1 . 5 5 . 4 4 . 1 1 . 1 1 . 1 1 . 5 5 . 2 1  1 22 26  . 1
PROGRES2: 1 . 5 5 . 6

   CASE#:  70 231 2 4 1 1 1 6 1 1 1 1 5 5 6 . 3 3 . 2 2 . 2 1 . 1 1 . 4 5 . 5 5
PROBSOL3: . 5 5 . 1 1 . 4 5 . 1 1 . 4 4 . 1 1 . 4 5 . 4 5 . 1 1 . 1 1 . 5 5 . 5
 APPREC2: 5 . 2 2 . 1 1 . 5 5 . 2 2 . 2 2 . 1 1 . 1 1 . 5 5 . 2 1  1 22 26  . 1
PROGRES2: . . 5 . . 4

   CASE#:  71 232 1 4 1 3 1 6 3 1 1 1 1 5 7 . 3 1 . 2 3 . 1 2 . 2 2 . 5 5 . 5 5
PROBSOL3: . 5 5 . 3 3 . 5 4 . 1 1 . 5 3 . 2 1 . 4 4 . 4 4 . 3 1 . 2 3 . 2 4 . 4
 APPREC2: 4 . 2 4 . 4 2 . 5 2 . 4 4 . 4 2 . 1 2 . 1 2 . 5 4 . 2 1  2 16 28  . 5
PROGRES2: 4 . 5 5 . 7

   CASE#:  72 232 2 4 1 3 1 6 1 1 1 1 1 5 7 . . 2 . 3 3 . 2 2 . 1 2 . 5 5 . 5 5
PROBSOL3: . 4 5 . 2 2 . 5 5 . 1 1 . 2 2 . 2 1 . 4 5 . 4 4 . 1 2 . 1 1 . 5 5 . 4
 APPREC2: 4 . 2 4 . 2 2 . 5 5 . 4 5 . 3 5 . 1 1 . 1 1 . 2 5 . 2 1  2 22 26  . 4
PROGRES2: 4 . 5 5 . 5
```

```
                                                                              MORE

   CASE#:  73 234 1 4 1 8 1 6 3 1 1 1 1 6 7 . 1 1 . 3 2 . 3 3 . 3 3 . 5 5 . 5 5
PROBSOL3: . 4 4 . 3 1 . 1 1 . 1 1 . 5 4 . 3 2 . 4 3 . 4 3 . 1 1 . 2 2 . 4 4 . 4
 APPREC2: 4 . 4 4 . 2 4 . 4 4 . 5 5 . 2 2 . 2 2 . 4 2 . 2 4 . 2 1  0 29 34   . 3
PROGRES2: 3 . 3 3 . 2

   CASE#:  74 234 2 4 1 8 1 6 1 1 1 1 1 6 7 . 1 1 . 2 1 . 2 2 . 2 1 . 5 5 . 5 5
PROBSOL3: . 3 5 . 2 1 . 1 4 . 1 1 . 5 5 . 3 2 . 4 5 . 5 5 . 3 4 . 2 2 . 5 4 . 5
 APPREC2: 5 . 5 4 . 4 4 . 4 5 . 5 4 . 4 2 . 3 2 . 3 4 . 3 4 . 2 1  0 29 34   . 4
PROGRES2: 4 . 3 4 . 4

   CASE#:  75 235 1 3 1 1 1 2 3 1 1 0 4 5 5 6 3 1 3 2 2 5 2 5 5 3 4 5 2 4 4 3 2
PROBSOL3: 5 2 5 4 1 4 4 1 1 2 1 1 2 5 5 5 5 5 5 3 2 5 4 3 1 1 2 1 3 4 . . 5 5
 APPREC2: 4 3 3 2 5 1 4 5 4 5 5 5 5 4 5 5 2 5 3 1 4 3 5 4 5 2 2 12  4  8 12 1
PROGRES2: 4 1 5 3 3 6

   CASE#:  76 235 2 4 1 2 1 4 1 1 1 0 4 5 5 6 3 1 3 2 4 3 2 2 4 4 4 4 1 3 4 3 2
PROBSOL3: 5 5 4 4 1 1 3 1 5 3 1 5 3 3 3 5 2 3 . 5 4 4 5 4 2 1 3 1 3 2 1 4 . 4 5
 APPREC2: 4 4 1 5 4 2 2 2 5 5 5 5 3 5 1 1 4 1 1 1 1 1 4 5 2 5 2 2 12  4  8 12 1
PROGRES2: 1 1 4 5 4 6

   CASE#:  77 236 1 4 1 2 1 6 1 1 2 1 3 5 6 . 3 3 . 2 2 . . 2 . 1 1 . 5 4 . 5 5
PROBSOL3: . 4 4 . 1 2 . 3 3 . 1 1 . 4 4 . 1 1 . 4 4 . 4 4 . 1 1 . 1 2 . 5 4 . 5
 APPREC2: 4 . 3 4 . 1 2 . 5 4 . 2 4 . 2 2 . 1 1 . 1 1 . 5 5 . 2 1  0 23 29   . 3
```

```
                                                                        MORE
 PROGRES2: 3 . 4 5 . 3

    CASE#:  78 236 2 4 1 4 1 6 1 1 2 1 3 5 6 . 1 2 . 2 2 . 2 1 . 1 1 . 4 5 . 3 4
 PROBSOL3: . 3 3 . 1 1 . 3 3 . 1 1 . 4 3 . 2 1 . 2 3 . 4 3 . 1 1 . 2 2 . 5 5 . 4
  APPREC2: 5 . 2 2 . 2 2 . 5 5 . 4 4 . 2 3 . 1 1 . 1 1 . 5 5 . 2 1  0 23 29  . 3
 PROGRES2: 2 . 5 4 . 5

    CASE#:  79 301 5 5 1 . 2 2 1 1 . 0 4 5 6 7 3 3 3 4 4 4 3 3 3 4 3 3 5 1 5 4 3
 PROBSOL3: 3 3 2 2 1 1 1 1 1 1 1 2 4 2 . . 1 1 1 4 1 2 2 2 3 4 4 2 2 3 4 4 1 3 5
  APPREC2: 3 3 2 4 5 1 3 3 4 4 3 5 4 5 5 4 4 1 3 3 4 3 4 4 4 5 3 .  .  .  .  . .
 PROGRES2: . . . . . .

    CASE#:  80 309 1 3 1 2 1 2 5 4 2 0 4 8 9 . 3 3 . 2 2 . 2 3 . 1 3 . 1 3 . 5 5
 PROBSOL3: . 5 5 . 1 1 . 4 3 . 1 1 . 5 5 . 1 5 . 4 1 . 4 2 . 1 4 . 1 3 . 5 3 . 5
  APPREC2: 5 . 1 2 . 1 1 . 5 5 . 5 5 . 1 3 . 1 1 . 1 1 . 5 5 . 3 .  .  .  .  . .
 PROGRES2: . . . . . .

    CASE#:  81 321 1 4 1 1 3 5 1 1 2 0 5 5 5 6 3 3 3 2 2 2 2 1 2 1 2 1 1 1 1 5 5
 PROBSOL3: 5 5 4 5 1 2 2 1 2 1 1 1 1 4 4 2 1 1 1 4 4 2 4 4 2 1 1 1 1 1 1 5 5 2 4
  APPREC2: 3 3 4 5 4 1 2 1 5 5 5 5 5 4 1 2 1 1 1 5 1 1 1 5 5 5 3 .  .  .  .  . .
 PROGRES2: . . . . . .

    CASE#:  82 321 2 4 1 1 2 6 5 1 2 0 5 5 5 6 3 3 3 3 3 2 1 2 2 3 3 3 1 2 2 4 5
 PROBSOL3: 5 4 4 3 2 2 1 1 1 1 1 1 1 2 2 4 1 1 1 3 3 3 4 4 4 1 1 2 1 1 1 5 5 2 4
```

```
                                                              MORE
 APPREC2: 3 4 4 4 4 1 1 1 5 5 5 2 2 2 2 1 1 2 1 1 2 1 1 4 4 4 3 . . . . . .
PROGRES2: . . . . . .

   CASE#:  83 324 1 3 1 1 2 4 1 1 1 0 4 5 6 7 3 3 3 2 3 2 2 2 1 4 4 5 5 5 5 2 3
PROBSOL3: 3 4 4 4 1 1 1 1 1 1 2 2 2 1 2 2 1 1 1 1 3 2 2 2 2 4 3 1 2 1 1 5 4 1 4
 APPREC2: 4 4 5 4 4 3 3 3 5 4 5 5 5 5 5 4 5 4 4 4 5 5 5 1 4 1 3 . . . . . .
PROGRES2: . . . . . .

   CASE#:  84 324 2 3 1 1 2 3 1 1 1 0 4 5 6 7 3 3 3 2 3 2 1 2 1 3 3 3 5 5 5 5 5
PROBSOL3: 5 4 4 5 2 2 4 1 1 1 2 2 2 1 1 1 1 1 1 4 4 4 3 3 4 3 2 3 3 3 1 4 4 5 4
 APPREC2: 4 4 2 2 2 1 2 2 5 5 5 4 4 4 4 4 4 2 2 2 4 3 4 4 3 3 3 . . . . . .
PROGRES2: . . . . . .

   CASE#:  85 326 1 4 1 1 3 4 1 1 2 1 4 5 6 . 2 2 . 2 3 . 2 2 . 1 2 . 5 5 . 5 3
PROBSOL3: . 5 . . 2 1 . 2 2 . 1 1 . 3 2 . 1 1 . 2 2 . 2 3 . 3 3 . 2 1 . 2 4 . 4
 APPREC2: 4 . 3 4 . 2 3 . 5 4 . 4 4 . 2 2 . 2 3 . 1 2 . 4 4 . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#:  86 326 2 4 1 1 3 6 1 1 2 1 4 5 6 . 3 3 . 3 4 . 2 2 . 1 1 . 5 5 . 4 5
PROBSOL3: . 4 4 . 1 2 . 1 1 . 1 1 . 4 4 . 1 1 . 4 4 . 4 4 . 3 1 . 2 3 . 3 3 . 4
 APPREC2: 4 . 4 2 . 2 2 . 5 5 . 4 4 . 2 4 . 2 1 . 2 1 . 4 4 . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#:  87 350 1 4 1 1 1 5 1 1 2 0 4 5 6 6 3 3 3 2 3 3 3 3 2 1 1 1 4 5 5 5 4
```

```
                                                                  MORE
PROBSOL3: 4 5 3 3 2 1 2 2 2 3 1 1 2 4 3 2 3 3 3 5 4 4 4 4 4 1 2 2 4 3 2 4 5 5 4
 APPREC2: 5 5 2 2 2 1 1 1 5 5 5 5 5 5 4 4 4 1 1 1 2 4 2 4 4 4 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#:  88 350 2 4 1 1 3 4 1 1 2 0 4 6 . . 3 . . 2 . . 1 . . 1 . . 5 . . 4 .
PROBSOL3: . 4 . . 3 . . 3 . . 1 . . 2 . . 3 . . 3 . . 3 . . 1 . . 2 . . 4 . . 4
 APPREC2: . . 1 . . 1 . . 4 . . 4 . . 4 . . 1 . . 1 . . 4 . . 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#:  89 355 2 4 1 . 2 3 4 5 . 1 4 6 . . 3 . . 3 . . 3 . . . . . . 4 . . 5 .
PROBSOL3: . 5 . . 1 . . 1 . . 1 . . 2 . . 2 . . 4 . . 4 . . 2 . . 1 . . 4 . . 5
 APPREC2: . . 1 . . 1 . . 5 . . 5 . . 2 . . 1 . . 5 . . 5 . . 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#:  90 361 1 4 1 2 3 2 4 4 2 2 4 6 6 7 . 3 2 . 4 4 3 2 3 2 1 . 1 1 1 4 5
PROBSOL3: 5 5 5 5 3 5 3 3 3 3 3 3 2 1 1 2 3 3 3 2 1 4 2 1 2 5 2 4 1 5 2 5 . 4 4
 APPREC2: 2 5 3 5 4 4 2 2 5 5 5 3 5 5 5 2 3 2 3 3 3 1 1 2 1 2 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#:  91 363 1 3 1 4 2 3 1 1 1 0 4 5 . . 3 . . 3 . . 3 . . 1 . . 5 . . 4 .
PROBSOL3: . 3 . . . . . . . . . . . 3 . . . . . 2 . . 4 . . . . . . . . 4 . . 5
 APPREC2: . . 2 . . 2 . . 5 . . 5 . . 2 . . 1 . . 1 . . 5 . . 3 .  .  .  .  . .
PROGRES2: . . . . . .
```

```
                                                                            MORE
   CASE#:  92 363 2 3 1 4 2 3 1 1 1 0 4 5 . . 3 . . 3 . . 3 . . 3 . . 5 . . 5 .
PROBSOL3: . . . . . . . 5 . . . . . . . . . . . 2 . . 4 . . 3 . . 1 . . 5 . . 4
 APPREC2: . . 2 . . 2 . . 5 . . 4 . . 2 . . 1 . . 1 . . 4 . . 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#:  93 372 1 3 1 . . 4 1 1 1 0 4 7 . . 3 . . 1 . . 1 . . 1 . . 3 . . 5 .
PROBSOL3: . 5 . . 2 . . 1 . . 1 . . 3 . . 1 . . 4 . . 3 . . 2 . . 1 . . 4 . . 5
 APPREC2: . . 4 . . 1 . . 5 . . 1 . . 1 . . 1 . . 1 . . 5 . . 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#:  94 372 2 3 1 2 2 3 1 1 1 0 4 7 . . 3 . . 3 . . 2 . . 1 . . 5 . . 5 .
PROBSOL3: . 4 . . 3 . . 1 . . 3 . . 3 . . 1 . . 4 . . 4 . . 3 . . 2 . . . . . 4
 APPREC2: . . 4 . . 3 . . 2 . . 5 . . 4 . . 2 . . 1 . . 4 . . 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#:  95 376 1 2 1 1 3 5 1 2 . 0 3 6 . . 3 . . 2 . . 1 . . 2 . . 2 . . 2 .
PROBSOL3: . . . . . . . . . . . . . . . . . . . 4 . . . . . . . . . . . 4 . . 4
 APPREC2: . . 2 . . 1 . . 5 . . 5 . . 4 . . 2 . . 1 . . 4 . . 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#:  96 377 1 3 1 2 1 3 2 1 2 0 1 4 4 5 3 3 3 . 4 . 2 3 . 1 2 2 3 1 3 4 4
PROBSOL3: 5 5 3 5 2 1 1 5 5 5 1 . 1 2 1 2 1 1 2 3 3 2 4 3 4 2 2 2 1 2 2 . 2 2 .
 APPREC2: 3 4 4 4 3 2 2 2 5 4 5 4 4 4 2 4 4 1 2 2 1 2 3 5 4 4 3 .  .  .  .  . .
PROGRES2: . . . . . .
```

```
                                                                    MORE

   CASE#:  97 377 2 3 1 2 1 4 1 1 2 0 1 4 4 5 3 3 3 2 1 1 2 1 2 2 1 1 1 2 2 5 4
PROBSOL3: 5 4 5 4 1 1 1 5 5 5 1 1 1 2 2 2 1 1 1 3 1 5 4 5 5 1 3 2 2 1 1 5 5 5 3
 APPREC2: 5 5 4 4 2 1 1 1 5 5 5 4 4 4 4 4 4 2 1 2 3 4 2 5 4 5 3 . . . . . . .
PROGRES2: . . . . . .

   CASE#:  98 382 1 2 6 1 3 5 1 2 2 0 4 6 6 . 3 3 . 3 4 . 2 3 . 3 5 . 3 2 . 5 3
PROBSOL3: . 4 3 . 2 2 . 3 3 . 1 1 . 2 3 . 1 3 . 2 1 . 3 1 . 2 5 . 2 4 . 4 4 . 5
 APPREC2: 5 . 4 4 . 2 3 . 5 4 . 5 3 . 1 2 . 2 2 . 1 4 . 5 1 . 3 . . . . . . .
PROGRES2: . . . . . .

   CASE#:  99 383 1 3 1 1 1 6 2 1 2 2 1 3 3 4 3 3 3 2 2 2 2 2 3 2 2 2 3 4 4 4 4
PROBSOL3: 5 2 4 4 2 2 2 4 4 4 2 1 1 3 2 3 1 1 1 4 3 2 3 3 3 2 2 3 2 2 1 4 4 3 5
 APPREC2: 4 4 2 2 4 2 1 1 5 5 5 4 4 4 2 3 2 1 2 2 4 4 4 4 4 4 3 . . . . . . .
PROGRES2: . . . . . .

   CASE#: 100 400 1 3 1 . 2 4 1 4 2 0 4 7 . . 3 . . 2 . . 2 . . 1 . . 1 . . 4 .
PROBSOL3: . 4 . . 1 . . 1 . . 1 . . 4 . . 5 . . 2 . . 2 . . 1 . . 1 . . 2 . . 4
 APPREC2: . . 4 . . 1 . . 5 . . 5 . . 4 . . 2 . . 4 . . 4 . . 3 . . . . . . .
PROGRES2: . . . . . .

   CASE#: 101 400 2 3 1 . 2 3 1 4 2 0 4 7 . . 3 . . 4 . . 3 . . 1 . . 3 . . 1 .
PROBSOL3: . 2 . . 1 . . 1 . . 3 . . 4 . . 1 . . 3 . . 4 . . 4 . . 3 . . 4 . . 4
 APPREC2: . . 2 . . 1 . . 5 . . 4 . . 2 . . 1 . . 4 . . 5 . . 3 . . . . . . .
```

```
                                                            MORE
PROGRES2: . . . . . .

   CASE#: 102 402 2 4 3 . 2 2 1 1 1 . 4 4 . . 3 . . 3 . . 3 . . 3 . . 3 . . 4 .
PROBSOL3: . 3 . . 1 . . 1 . . 1 . . 2 . . 1 . . 3 . . 4 . . 2 . . 2 . . 3 . . 4
 APPREC2: . . 3 . . 2 . . 4 . . 4 . . 4 . . 2 . . 2 . . 3 . . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 103 403 1 2 1 . 2 2 5 1 . 1 4 4 . . 3 . . 2 . . 2 . . 3 . . 3 . . 3 .
PROBSOL3: . 3 . . 2 . . 1 . . 1 . . 3 . . 1 . . 2 . . 2 . . 1 . . 1 . . 4 . . 4
 APPREC2: . . 5 . . 2 . . 5 . . 3 . . 4 . . 1 . . 1 . . 4 . . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 104 405 1 2 1 1 3 2 2 3 1 0 4 3 4 . 3 3 . 4 3 . 1 2 . 2 3 . 1 1 . 3 3
PROBSOL3: . 2 3 . 2 1 . 2 3 . 1 1 . 4 4 . 1 1 . 1 4 . 3 4 . 5 3 . 3 1 . 4 4 . 4
 APPREC2: 4 . 2 2 . 1 1 . 5 5 . 4 5 . 2 4 . 2 1 . 2 2 . 5 5 . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 105 405 6 2 1 1 3 2 1 3 1 0 4 3 4 . 3 3 . 4 2 . 1 2 . 1 2 . 1 1 . 5 1
PROBSOL3: . 3 3 . 1 2 . 1 1 . 1 3 . 3 2 . 1 1 . 5 3 . 5 3 . 1 2 . 1 1 . 4 4 . 1
 APPREC2: 3 . 4 4 . 3 1 . 5 5 . 1 2 . 2 4 . 1 2 . 1 4 . 5 4 . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 106 406 1 3 1 1 1 5 1 1 1 0 4 3 4 5 3 3 3 5 2 3 1 1 2 2 4 5 1 1 4 5 5
PROBSOL3: 5 4 5 4 3 2 1 5 5 4 1 1 1 5 5 1 1 1 1 5 5 5 5 5 5 2 2 1 2 2 4 5 4 4 5
```

```
                                                                  MORE
  APPREC2: 5 5 2 1 3 4 1 1 5 5 5 5 4 4 4 4 4 1 1 1 1 1 1 5 5 5 3 . . . . . .
 PROGRES2: . . . . . . .

    CASE#: 107 406 2 3 1 1 3 5 1 1 1 0 4 3 4 5 3 3 3 2 2 4 1 2 2 1 2 3 2 4 4 5 3
 PROBSOL3: 5 5 2 3 3 4 2 1 1 1 1 1 1 4 3 2 1 1 1 4 5 3 4 5 3 2 2 3 1 1 1 5 4 2 4
  APPREC2: 4 4 2 4 4 2 4 4 5 5 5 4 5 5 4 2 2 3 1 3 2 1 2 5 5 4 3 . . . . . .
 PROGRES2: . . . . . . .

    CASE#: 108 408 7 2 1 1 3 6 1 2 1 1 2 5 . . 3 . . 1 . . 1 . . 2 . . 4 . . 4 .
 PROBSOL3: . 4 . . 1 . . 2 . . 1 . . 1 . . 1 . . 5 . . 4 . . 1 . . 1 . . 5 . . 4
  APPREC2: . . 3 . . 1 . . 5 . . 5 . . 2 . . 5 . . 2 . . 1 . . 3 . . . . . .
 PROGRES2: . . . . . . .

    CASE#: 109 411 1 3 1 4 2 3 1 1 1 1 5 3 4 . 3 3 . 2 3 . 2 2 . 3 2 . 3 4 . 4 4
 PROBSOL3: . 4 5 . 2 1 . 2 1 . 1 1 . 2 5 . 2 4 . 1 3 . 3 2 . 3 3 . 4 2 . 2 4 . 2
  APPREC2: 4 . 4 2 . 3 1 . 4 5 . 2 2 . 2 2 . 2 2 . 2 2 . 4 4 . 3 . . . . . .
 PROGRES2: . . . . . . .

    CASE#: 110 411 2 3 1 1 3 4 1 1 1 1 5 3 4 . 3 3 . 2 3 . 2 2 . 2 2 . 3 1 . 4 3
 PROBSOL3: . 5 4 . 1 2 . 3 2 . 1 1 . 3 3 . 1 1 . 4 4 . 4 4 . 1 2 . 1 1 . 5 . . 4
  APPREC2: 5 . 2 5 . 1 3 . 5 1 . 3 4 . 1 1 . 1 1 . 1 1 . 5 4 . 3 . . . . . .
 PROGRES2: . . . . . . .

    CASE#: 111 413 1 3 1 2 3 4 3 1 . 1 1 1 2 . 3 3 . 3 2 . 3 2 . 2 1 . 5 5 . 4 5
```

```
                                                                         MORE
PROBSOL3: . 3 4 . 3 2 . 2 2 . 1 1 . 4 5 . 1 1 . 3 . . 2 3 . 1 1 . 1 3 . 4 2 . 3
 APPREC2: 4 . 2 2 . 2 1 . 4 5 . 5 5 . 4 4 . 2 2 . 1 1 . 4 4 . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 112 417 1 3 1 2 3 5 1 1 1 1 1 2 . . 3 . . 2 . . 3 . . 3 . . 5 . . 5 .
PROBSOL3: . 4 . . 2 . . 1 . . 1 . . 2 . . 1 . . 3 . . 2 . . 2 . . 3 . . 4 . . 5
 APPREC2: . . 4 . . 2 . . 5 . . 5 . . 1 . . 1 . . 3 . . 5 . . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 113 417 2 4 1 2 2 2 4 1 1 1 1 2 . . 3 . . 2 . . 2 . . 2 . . 2 . . 4 .
PROBSOL3: . 3 . . 1 . . 1 . . 2 . . 1 . . 1 . . 3 . . 2 . . 3 . . 2 . . 4 . . 5
 APPREC2: . . 4 . . 2 . . 5 . . 2 . . 2 . . 1 . . 1 . . 5 . . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 114 429 1 3 1 . 2 4 3 1 1 1 1 3 4 5 3 3 3 2 3 2 2 2 2 1 1 1 5 4 4 5 5
PROBSOL3: 5 3 4 4 2 1 1 1 1 1 3 2 2 3 2 2 2 1 1 2 5 4 4 5 4 1 2 1 1 1 1 2 2 4 3
 APPREC2: 5 5 5 5 4 2 4 2 5 5 5 5 4 4 4 2 2 1 2 1 1 2 1 2 4 4 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 115 429 2 4 1 . 2 5 1 1 1 1 1 3 4 5 3 3 3 3 2 2 3 3 2 1 1 2 5 3 3 5 5
PROBSOL3: 5 2 4 4 2 2 2 1 1 2 3 2 2 3 3 3 2 1 1 2 4 4 3 4 4 1 2 2 1 3 1 4 2 4 3
 APPREC2: 3 4 5 4 2 2 2 2 5 5 5 5 4 5 4 4 4 1 2 1 1 3 1 4 3 4 3 . . . . . .
PROGRES2: . . . . . .
```

```
                                                                                    MORE
   CASE#: 116 430 1 3 1 1 3 6 1 1 1 0 4 3 4 5 3 3 3 2 3 2 2 2 2 2 2 2 4 3 3 5 5
PROBSOL3: 5 5 1 1 1 1 1 2 3 1 1 1 1 1 1 1 1 1 1 3 3 3 3 3 4 2 2 2 1 1 1 5 5 4 4
 APPREC2: 5 4 2 1 4 1 1 1 5 5 5 5 4 5 2 2 1 1 1 1 1 1 1 5 5 5 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 117 430 2 3 1 . 3 4 1 1 1 0 4 3 4 5 3 3 3 3 2 2 3 3 2 2 2 2 2 3 2 3 3
PROBSOL3: . 2 2 4 2 2 3 2 1 2 1 1 1 3 1 2 1 1 1 2 2 3 2 3 3 3 2 3 4 2 3 3 4 4 5
 APPREC2: 5 5 1 1 2 1 1 1 5 5 5 5 4 4 1 2 4 1 1 1 1 1 3 5 4 5 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 118 432 1 4 1 1 3 3 1 1 2 0 4 3 4 4 3 3 3 2 3 1 1 3 1 2 2 1 4 4 3 4 4
PROBSOL3: 4 3 4 3 1 1 1 3 2 2 1 1 1 4 3 2 1 1 1 5 3 3 4 2 2 1 3 1 1 3 1 4 4 4 4
 APPREC2: 3 4 1 3 2 1 1 2 5 5 5 4 4 4 2 4 2 1 2 1 2 2 2 4 3 4 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 119 432 2 4 1 1 2 6 1 1 2 0 4 3 4 4 3 3 3 3 4 3 3 3 1 3 2 3 5 5 5 5 5
PROBSOL3: 4 3 4 2 1 1 3 1 1 2 3 1 2 1 1 1 1 1 1 3 3 3 2 2 2 1 1 1 4 4 2 3 2 4 4
 APPREC2: 4 5 2 1 2 2 1 2 4 4 4 2 3 2 2 5 4 1 2 1 4 5 4 1 2 4 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 120 436 1 4 1 1 3 4 1 1 2 0 5 5 6 6 3 3 3 5 3 4 3 3 3 4 4 4 5 5 4 3 3
PROBSOL3: 4 3 5 4 4 2 2 2 1 3 2 2 1 3 3 3 2 1 3 3 3 2 2 3 2 4 4 4 1 2 2 4 4 4 4
 APPREC2: 4 3 4 2 4 3 1 2 5 5 5 4 4 3 3 3 3 2 2 3 2 3 2 2 4 4 3 . . . . . .
PROGRES2: . . . . . .
```

```
                                                                          MORE

   CASE#: 121 436 2 4 1 1 2 3 1 1 2 0 5 5 6 7 3 3 3 4 4 3 2 3 2 2 2 2 5 5 5 3 3
PROBSOL3: 5 5 4 3 4 4 4 2 2 1 1 1 1 1 2 2 2 2 1 4 4 4 4 3 4 2 3 3 2 2 2 5 4 5 4
 APPREC2: 4 4 2 3 4 1 1 1 5 5 5 5 4 4 4 4 2 1 2 2 4 2 1 5 4 5 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#: 122 438 1 4 1 1 1 5 1 1 1 1 4 5 6 7 3 3 3 4 3 3 3 4 3 3 3 2 5 3 4 3 4
PROBSOL3: 4 4 4 4 2 3 3 4 4 4 3 4 1 4 3 4 2 3 3 2 3 4 2 3 4 4 3 4 4 2 2 4 4 2 4
 APPREC2: 3 4 2 4 4 3 4 3 5 5 5 4 5 4 2 3 2 2 3 4 4 4 3 4 5 4 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#: 123 438 2 4 1 1 1 3 1 1 1 1 4 5 6 7 3 3 3 4 3 3 4 3 2 2 3 2 3 3 3 4 4
PROBSOL3: 4 4 4 4 4 3 2 3 3 2 4 3 3 2 3 2 1 1 1 2 4 2 2 4 3 2 4 3 2 1 1 4 . 4 3
 APPREC2: 3 3 2 2 4 2 4 4 4 4 4 4 2 4 5 4 . 1 2 1 4 4 3 4 2 4 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#: 124 441 1 4 1 2 2 5 1 1 2 1 4 3 . . 3 . . 2 . . 2 . . 1 . . 3 . . 2 .
PROBSOL3: . 2 . . 3 . . 1 . . 2 . . 1 . . 1 . . 3 . . 3 . . 4 . . 3 . . 4 . . 4
 APPREC2: . . . . . 1 . . 5 . . 4 . . 4 . . 1 . . 2 . . 4 . . 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#: 125 441 2 3 1 2 2 4 1 1 2 1 4 3 . . 3 . . 1 . . 1 . . 1 . . 3 . . 5 .
PROBSOL3: . 4 . . 3 . . 1 . . 2 . . 1 . . 1 . . 4 . . 4 . . 1 . . 1 . . 5 . . 4
 APPREC2: . . 2 . . 3 . . 5 . . 4 . . 2 . . 1 . . 1 . . 4 . . 3 .  .  .  .  . .
```

```
                                                                                    MORE
PROGRES2: . . . . . .

   CASE#: 126 456 1 4 1 . 2 6 2 1 1 1 5 6 7 . 3 3 . 2 2 . 1 2 . 1 1 . 4 4 . 5 5
PROBSOL3: . 4 4 . 3 4 . 1 1 . 3 2 . 3 2 . 1 1 . 4 3 . 4 4 . 3 2 . 2 2 . 4 4 . 4
 APPREC2: 4 . 1 4 . 1 2 . 5 5 . 5 4 . 2 2 . 1 1 . 1 1 . 4 5 . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 127 456 2 4 1 1 2 6 1 1 1 1 5 6 8 . 3 3 . 1 2 . 1 2 . 1 1 . 5 5 . 5 5
PROBSOL3: . 4 2 . 2 2 . 1 1 . 2 2 . 2 2 . 1 1 . 4 5 . 4 5 . 2 1 . 1 1 . 5 5 . 4
 APPREC2: 4 . 1 1 . 1 1 . 5 5 . 5 5 . 5 4 . 1 1 . 1 3 . 5 5 . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 128 462 1 3 1 1 3 5 2 1 2 0 5 4 5 5 3 3 3 2 2 1 1 1 1 2 2 1 4 4 5 5 5
PROBSOL3: 5 3 4 4 3 2 3 3 4.2 1 4 1 2 2 1 1 . 1 4 4 4 4 4 4 1 2 3 2 2 2 4 4 4 4
 APPREC2: 4 3 2 2 4 2 2 3 5 5 5 4 5 5 2 4 2 2 1 1 2 1 2 3 3 4 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 129 462 2 3 1 1 3 5 1 1 2 0 5 4 5 5 3 3 3 2 2 2 1 1 1 2 3 2 5 5 5 5 5
PROBSOL3: 4 4 5 4 1 1 2 2 2 2 1 1 1 2 1 1 1 1 1 4 5 4 3 5 3 2 1 1 1 2 1 3 4 4 3
 APPREC2: 3 3 2 4 4 1 1 2 5 5 5 4 4 5 4 3 3 2 3 2 1 3 1 4 4 5 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 130 463 1 2 1 2 3 2 2 1 1 0 4 6 6 7 1 1 3 1 2 2 1 1 1 1 1 1 1 5 4 5 4
PROBSOL3: 4 4 5 4 1 1 1 5 5 4 1 1 1 3 3 3 1 1 1 5 3 4 5 5 5 4 5 3 1 2 2 . 4 5 5
```

```
                                                                     MORE
 APPREC2: 5  5  5  2  1  2  2  1  1  5  5  5  4  4  1  1  1  1  1  1  1  1  1  5  4  4  3  .    .    .    .    .  .
PROGRES2: .  .  .  .  .  .

   CASE#: 131  465  1  4  1  .  2  3  1  1  2  1  5  4  5  6  3  3  3  2  2  2  3  2  2  3  3  3  3  2  2  4  5
PROBSOL3: 3  5  4  4  2  3  3  1  1  1  1  1  1  3  2  3  1  1  1  4  3  3  5  4  4  3  2  4  3  2  3  4  4  4  4
 APPREC2: 4  4  4  4  4  1  1  2  5  5  5  2  3  3  2  1  2  2  1  2  1  1  2  5  5  4  3  .    .    .    .    .  .
PROGRES2: .  .  .  .  .  .

   CASE#: 132  465  2  4  1  .  2  3  4  1  2  1  5  4  5  6  3  3  3  2  2  3  1  2  3  2  2  3  3  4  3  5  4
PROBSOL3: 4  5  4  4  4  3  3  1  1  1  1  1  1  1  1  1  1  1  1  3  3  2  2  3  2  4  4  3  1  1  2  4  4  3  4
 APPREC2: 4  4  4  4  4  1  2  2  4  4  5  3  3  3  2  1  4  2  1  2  2  1  2  3  4  4  3  .    .    .    .    .  .
PROGRES2: .  .  .  .  .  .

   CASE#: 133  493  2  3  1  2  2  3  1  1  2  0  4  4  .  .  3  .  .  2  .  .  1  .  .  1  .  .  5  .  .  5  .
PROBSOL3: .  3  .  .  3  .  .  1  .  .  1  .  .  2  .  .  1  .  .  3  .  .  2  .  .  1  .  .  2  .  .  5  .  .  3
 APPREC2: .  .  4  .  .  4  .  .  5  .  .  4  .  .  3  .  .  1  .  .  1  .  .  4  .  .  3  .    .    .    .    .  .
PROGRES2: .  .  .  .  .  .

   CASE#: 134  494  1  4  1  2  3  5  4  1  2  0  5  4  5  5  3  3  3  4  4  2  4  4  3  3  4  2  5  5  5  4  5
PROBSOL3: 5  4  5  4  1  2  1  1  1  1  1  1  1  5  1  3  1  1  1  1  1  2  1  1  2  1  1  1  3  1  3  4  4  4  4
 APPREC2: 4  4  4  4  4  2  2  2  3  3  4  5  3  3  2  2  2  2  2  1  4  4  2  4  4  4  3  .    .    .    .    .  .
PROGRES2: .  .  .  .  .  .

   CASE#: 135  494  2  4  1  2  3  3  1  1  2  0  5  4  5  6  3  3  3  .  2  2  2  1  1  2  1  1  1  5  4  3  5
```

```
                                                                                MORE
PROBSOL3: 4  2  4  4  1  2  1  1  1  3  1  2  1  2  1  1  1  1  1  2  3  3  2  4  2  1  5  1  1  1  1  .  .  4  4
 APPREC2: 4  4  4  4  4  3  4  1  5  1  5  4  5  5  3  4  1  2  1  1  4  4  4  4  4  4  3  .   .   .   .   .  .
PROGRES2: .  .  .  .  .  .

   CASE#: 136   495   1  4  1  8  3  6  1  1  2  0  4  3  4  5  3  3  3  3  2  3  2  1  2  2  1  1  4  4  4  4  5
PROBSOL3: 5  4  3  4  3  3  3  1  1  1  1  1  1  4  4  4  1  1  1  4  4  4  3  4  4  1  2  2  2  3  1  2  2  1  4
 APPREC2: 4  5  2  2  2  1  2  1  5  5  5  4  4  4  2  2  2  1  2  1  2  2  2  4  5  5  3  .   .   .   .   .  .
PROGRES2: .  .  .  .  .  .

   CASE#: 137   495   2  3  1  8  3  6  1  1  2  0  4  3  4  5  3  3  3  3  2  4  1  2  1  1  1  1  4  5  4  4  4
PROBSOL3: 4  4  4  3  1  3  3  1  1  1  1  1  1  3  3  2  1  1  1  4  5  5  4  5  4  1  3  2  3  1  2  5  5  5  5
 APPREC2: 5  4  2  1  2  1  1  1  5  5  5  2  4  4  2  2  1  2  2  1  2  2  1  4  5  4  3  .   .   .   .   .  .
PROGRES2: .  .  .  .  .  .

   CASE#: 138   500   1  4  1  2  2  6  2  1  2  0  5  4  5  6  3  3  3  4  3  4  2  2  2  1  1  1  5  5  4  5  4
PROBSOL3: 4  4  4  4  4  3  3  4  2  2  3  2  2  4  3  2  1  1  1  4  4  4  4  4  4  4  4  4  2  1  1  5  5  5  4
 APPREC2: 4  5  4  3  2  4  2  2  5  5  5  4  4  4  5  4  4  2  2  2  1  2  2  4  4  5  3  .   .   .   .   .  .
PROGRES2: .  .  .  .  .  .

   CASE#: 139   500   2  4  1  2  2  6  1  1  2  0  5  4  5  6  3  3  3  2  2  3  1  2  2  1  1  1  5  5  5  5  5
PROBSOL3: 1  .  4  2  3  1  3  1  1  1  3  2  3  3  2  2  1  1  1  5  4  3  5  4  3  3  1  1  1  1  1  4  4  4  4
 APPREC2: 4  4  4  3  2  2  1  1  5  5  5  4  4  4  2  4  2  2  2  2  2  2  2  4  4  5  3  .   .   .   .   .  .
PROGRES2: .  .  .  .  .  .
```

```
                                                                                MORE
   CASE#: 140 503 1 4 1 . 2 6 5 1 1 1 5 6 6 7 3 3 3 3 3 3 2 3 2 1 1 1 5 5 5 4 4
PROBSOL3: 5 4 5 5 3 3 2 2 2 2 1 1 1 3 3 3 2 2 2 3 3 4 4 4 4 1 3 1 2 2 2 2 4 4 5
 APPREC2: 5 5 2 2 1 1 1 1 5 5 5 5 5 4 2 4 2 1 1 1 1 1 1 4 4 4 3 . . . . . .
PROGRES2: . . . . . . .

   CASE#: 141 512 1 4 1 . . 3 1 1 1 0 4 4 . . 3 . . 2 . . 2 . . 1 . . 5 . . 5 .
PROBSOL3: . 5 . . 2 . . 3 . . 2 . . 2 . . 1 . . . . . . 4 . . 2 . . 1 . . 4 . . 4
 APPREC2: . . 4 . . 1 . . 5 . . 4 . . 2 . . 1 . . 1 . . 4 . . 3 . . . . . .
PROGRES2: . . . . . . .

   CASE#: 142 514 1 4 1 1 1 4 1 1 1 1 4 3 4 4 3 3 3 4 4 3 3 2 1 2 1 1 4 3 4 5 5
PROBSOL3: 4 5 5 4 3 3 4 3 3 3 1 1 1 3 3 3 1 1 1 3 4 4 4 3 3 2 3 2 2 3 1 5 4 4 5
 APPREC2: 5 5 2 4 4 1 1 1 5 5 5 5 5 5 1 1 2 1 1 1 1 1 1 5 5 5 3 . . . . . .
PROGRES2: . . . . . . .

   CASE#: 143 514 2 3 1 1 1 4 5 1 1 1 4 3 4 4 3 3 3 3 3 4 2 2 3 1 3 1 4 4 3 4 4
PROBSOL3: 4 5 3 3 4 4 4 2 2 4 1 1 1 2 3 2 1 1 1 4 4 3 4 5 3 4 2 1 2 1 1 3 2 2 5
 APPREC2: 4 4 4 4 4 1 2 3 5 5 4 3 3 3 4 4 2 3 1 2 1 1 2 4 4 3 3 . . . . . .
PROGRES2: . . . . . . .

   CASE#: 144 515 1 4 1 4 2 6 1 1 1 1 4 4 5 6 3 3 3 2 3 3 2 4 2 1 3 2 5 5 5 5 5
PROBSOL3: 4 4 5 4 3 1 1 1 1 1 1 1 2 1 2 1 1 1 2 1 3 2 3 3 3 1 1 1 3 2 5 5 5 5 5
 APPREC2: 5 4 1 1 4 1 1 1 5 4 5 4 5 5 4 4 4 1 1 2 2 4 2 5 4 4 3 . . . . . .
PROGRES2: . . . . . . .
```

```
                                                                      MORE

   CASE#: 145 515 2 4 1 4 2 6 1 1 1 1 4 4 5 6 3 3 3 2 2 3 2 3 3 4 4 4 5 5 5 4 5
PROBSOL3: 4 4 4 3 1 2 4 1 1 1 1 1 1 1 1 1 1 1 1 1 3 4 2 2 2 1 1 1 1 1 1 4 5 4 5
 APPREC2: 4 3 2 4 3 1 1 1 5 5 5 4 5 3 2 2 1 1 1 1 1 1 1 4 4 2 3 .  .  .  .  . .
PROGRES2: . . . . . . .

   CASE#: 146 516 1 4 1 2 2 4 1 1 1 1 4 4 . . 3 . . 2 . . 2 . . 5 . . 5 . . 3 .
PROBSOL3: . 4 . . 1 . . 1 . . 1 . . 2 . . 1 . . 4 . . 3 . . 3 . . 1 . . 4 . . 5
 APPREC2: . . 1 . . 1 . . 5 . . 4 . . 2 . . 1 . . 2 . . 4 . . 3 .  .  .  .  . .
PROGRES2: . . . . . . .

   CASE#: 147 521 1 4 1 2 3 5 1 1 2 0 4 5 5 . 3 3 . 3 2 . 2 3 . 1 1 . 5 4 . 5 4
PROBSOL3: . 4 5 . 2 3 . 2 3 . 3 2 . 1 1 . 1 1 . 3 3 . 2 2 . 3 2 . 3 3 . 2 . . 4
 APPREC2: 2 . 3 4 . 1 2 . 5 5 . 1 1 . 4 2 . 2 3 . 1 2 . 4 4 . 3 .  .  .  .  . .
PROGRES2: . . . . . . .

   CASE#: 148 521 2 4 1 1 2 4 1 1 2 0 4 5 5 . 3 3 . 3 2 . 3 2 . 1 1 . 5 5 . 4 4
PROBSOL3: . 3 4 . 3 3 . 1 1 . 2 3 . 2 3 . 1 1 . 3 3 . 5 4 . 1 1 . 1 1 . 2 . . 4
 APPREC2: 4 . 4 4 . 2 4 . 4 4 . 5 5 . 2 2 . 2 2 . 3 1 . 2 2 . 3 .  .  .  .  . .
PROGRES2: . . . . . . .

   CASE#: 149 538 1 4 1 . 2 5 1 1 2 0 5 7 8 . 3 3 . 2 3 . 2 1 . 2 1 . 4 3 . 4 5
PROBSOL3: . 3 3 . 1 3 . 1 1 . 2 1 . 1 1 . 1 1 . 4 4 . 4 4 . 3 3 . 2 1 . 5 3 . 5
 APPREC2: 4 . 4 4 . 2 1 . 4 5 . 4 4 . 2 4 . 2 1 . 2 2 . 4 4 . 3 .  .  .  .  . .
```

```
                                                                   MORE
PROGRES2: . . . . . .

   CASE#: 150 541 1 3 1 . 2 4 1 4 2 0 4 6 7 7 3 3 3 1 1 1 1 1 1 1 1 1 5 5 4 5 5
PROBSOL3: 5 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 4 4 4 4 4 4 2 2 1 2 2 1 5 5 5 4
 APPREC2: 4 4 3 3 2 2 1 1 5 5 5 4 5 5 4 3 2 1 1 1 4 3 1 5 5 5 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#: 151 543 1 4 1 2 2 3 1 1 2 0 4 6 7 . 3 3 . 3 3 . 2 3 . 2 3 . 2 4 . 3 4
PROBSOL3: . 3 4 . 1 1 . 1 1 . 1 1 . 2 2 . 1 1 . 2 4 . 2 4 . 1 1 . 4 3 . 2 5 . 4
 APPREC2: 4 . 3 4 . 2 1 . 5 5 . 4 2 . 4 4 . 3 2 . 4 4 . 4 4 . 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#: 152 543 2 4 1 . 2 6 1 1 2 0 4 6 7 . 3 3 . 2 2 . 2 1 . 1 2 . 4 5 . 5 5
PROBSOL3: . 3 4 . 1 1 . 1 1 . 1 1 . 2 3 . 1 1 . 4 4 . 4 4 . 2 2 . 1 2 . 5 4 . 4
 APPREC2: 4 . 2 2 . 1 2 . 5 5 . 4 4 . 2 2 . 1 1 . 4 4 . 4 4 . 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#: 153 546 1 4 1 2 3 5 1 1 2 1 4 4 5 6 3 3 3 2 1 1 1 1 1 1 1 1 5 5 5 5 5
PROBSOL3: 5 4 4 3 1 1 1 1 1 1 1 1 1 2 2 3 1 1 1 4 5 5 3 5 5 3 2 3 1 1 1 4 5 5 4
 APPREC2: 5 5 2 4 1 1 1 1 5 5 5 5 5 5 2 2 1 1 1 1 1 1 1 5 5 5 3 .  .  .  .  . .
PROGRES2: . . . . . .

   CASE#: 154 546 2 4 1 2 3 5 1 1 2 1 4 4 5 6 3 3 3 2 1 2 1 1 1 1 1 1 5 5 5 5 5
PROBSOL3: 5 5 4 4 1 1 1 1 1 1 1 1 1 1 2 3 1 1 1 3 2 3 4 5 4 3 3 4 1 1 1 5 5 4 5
```

```
                                                                MORE
 APPREC2: 5 4 3 4 3 1 1 1 5 5 5 4 3 5 1 1 2 1 1 1 1 1 1 5 5 4 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 155 548 1 4 2 9 1 6 1 1 2 0 4 4 4 . 3 3 . 3 2 . 1 1 . 1 2 . 5 5 . 5 5
PROBSOL3: . 5 5 . 1 1 . 5 5 . 1 1 . 3 4 . 3 3 . 4 4 . 4 4 . 4 1 . 1 2 . 5 4 . 4
 APPREC2: 5 . 1 2 . 1 1 . 5 5 . 5 4 . 1 2 . 1 1 . 1 1 . 5 5 . 3 . . . . . .
PROGRES2: . . . . . .

   CASE#: 156 548 2 4 1 1 3 4 1 1 2 0 4 4 4 . 3 3 . 2 1 . 1 1 . 1 1 . 5 5 . 5 5
PROBSOL3: . 5 5 . 1 1 . 3 2 . 1 1 . 2 2 . 2 2 . 4 4 . 4 3 . 4 1 . 1 1 . 5 5 . 4
 APPREC2: 5 . 1 1 . 1 1 . 5 5 . 5 4 . 1 1 . 1 1 . 1 1 . 5 5 . 3 . . . . . .
PROGRES2: . . . . . .

Number of cases read =      156    Number of cases listed =      156
```

Appendix XXVI

Data File for Cross-Sectional Models

```
LIST VARIABLES=ALL.                                                    MORE

 N                                                                    E
 E       F   C   M     P R E R   F C   I R   P           R D C I   D  N    H
 W       A P H S A M F R E S E   R O A N E   H A A D C A E E O S   I  T  E A
 C   O   M A I T S U I O F C L D I U C T S U Y P C E O T S P N O   A  R  I P
 A   R   I R . R T T N B R A Y R E N C E T P H P C M M T T R F L   G  Y  P P
 S   I   L E A E E U S S A P G I N S O R L S L R E A P A R E L A E N  A  M Y
 E   G   Y N G S R A E O M T O N D E M S E E T E P N E C I S C T I O  G  O O
 #   #   # T E S Y L C L E V D K S L P T S T H C T D T H C S T N P S  E  S C

 1   1 102 1 2 2 2 1 5 5 5 1 1 1 5 4 4 4 2 2 2 4 2 2 4 2 2 2 2 4 1 1  1  0 4
 2   1 102 1 2 2 2 1 5 5 5 1 2 1 5 3 2 3 1 1 . 2 4 2 4 4 4 2 2 4 1 1  1  4 3
 3   1 102 1 3 2 2 1 5 5 5 1 2 1 4 3 4 4 1 1 4 4 2 2 4 4 2 2 2 4 1 1  1  9 4
 4   2 102 2 2 2 1 1 5 5 5 1 2 1 4 2 4 4 2 2 4 4 1 2 4 4 2 1 1 4 1 1  0  0 4
 5   2 102 2 2 3 2 1 5 5 4 1 1 1 3 2 4 4 2 2 5 5 2 2 4 2 2 2 2 4 1 1  0  6 4
 6   2 102 2 3 2 2 1 5 5 5 1 2 1 4 2 4 4 2 2 4 4 2 2 4 2 2 1 2 4 1 1  0 10 4
 7   3 104 1 4 4 4 3 5 4 4 4 1 1 1 3 1 1 1 3 1 5 1 4 4 4 5 2 4 2 1 2 13  0 5
 8   3 104 1 4 4 3 2 5 4 5 2 1 1 3 3 1 2 1 1 2 5 1 3 4 2 4 1 4 4 1 2 13  4 .
 9   4 104 2 4 3 3 2 5 4 4 4 1 2 1 2 3 3 4 1 4 4 3 2 5 5 4 2 4 3 1 2 13  0 5
10   4 104 2 4 3 2 2 5 4 4 4 1 1 1 3 4 4 4 3 4 5 5 3 5 5 5 2 4 4 1 2 13  4 .
11   5 106 1 2 1 1 1 5 5 5 2 5 1 4 1 4 4 1 2 4 3 2 5 5 2 4 1 1 5 1 2  3  1 4
12   6 106 2 2 1 2 1 5 5 5 2 5 1 4 1 4 4 1 1 5 5 2 4 5 2 2 1 1 5 1 2  3  2 5
13   7 107 1 2 3 3 1 5 3 5 1 2 2 5 2 3 2 2 1 5 5 1 1 4 5 4 2 1 5 1 1  3  2 4
14   7 107 1 3 2 1 1 5 5 5 2 3 2 4 1 4 3 5 1 2 5 1 3 4 2 2 3 1 5 1 1  3  9 4
```

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRES	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
15	8	107	2	2	2	1	1	5	5	5	1	1	3	4	1	3	3	3	1	3	4	3	1	5	5	1	1	1	5	1	1	3	2	5
16	8	107	2	3	3	2	1	5	5	5	1	1	3	3	1	4	4	5	1	3	3	1	3	5	5	2	1	1	5	1	1	3	9	5
17	9	108	1	1	1	1	1	5	5	4	1	1	1	3	1	4	3	4	1	4	4	1	1	5	3	1	1	1	5	1	1	0	0	5
18	9	108	1	3	2	2	1	5	5	5	1	1	1	3	1	4	4	5	1	5	5	1	1	5	.	4	1	1	5	1	1	0	4	5
19	10	108	2	1	1	2	1	5	5	4	1	1	1	4	1	4	4	2	1	4	5	1	1	5	3	2	1	1	1	1	1	0	0	5
20	10	108	2	3	2	2	1	5	5	5	2	5	1	5	1	4	4	2	2	4	4	1	1	5	4	4	2	1	4	1	1	0	4	5
21	11	112	1	3	3	1	1	5	5	5	2	1	1	5	1	4	5	2	1	2	5	1	1	5	1	1	1	1	4	1	2	6	1	5
22	12	112	2	3	.	3	3	2	5	5	4	3	3	2	1	5	4	3	3	4	4	4	4	5	3	3	3	4	2	1	2	6	1	5
23	13	114	3	2	2	2	1	4	5	5	1	5	1	4	1	2	2	1	1	4	3	2	1	5	4	2	1	1	5	1	1	1	1	5
24	13	114	3	3	2	2	1	3	5	5	2	5	1	4	2	3	5	1	1	4	3	1	1	5	4	2	1	1	5	1	1	1	8	5
25	14	114	4	2	2	1	1	4	5	5	2	5	1	4	1	3	3	3	2	5	3	1	3	5	4	2	1	1	5	1	1	1	1	5
26	15	125	1	5	2	2	3	5	4	4	1	1	1	4	3	4	4	2	3	4	4	3	1	5	5	3	1	2	4	1	2	21	0	4
27	15	125	1	6	3	2	2	4	4	4	1	1	1	3	2	3	4	2	3	4	4	4	2	5	4	3	1	3	4	1	2	21	6	4
28	16	125	2	5	2	1	1	1	.	5	3	1	1	5	1	3	3	5	2	4	5	3	2	5	3	4	1	3	5	1	2	21	0	5

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
29	16	125	2	6	3	2	2	2	3	4	2	1	3	5	1	4	3	5	3	4	5	2	3	5	3	5	1	4	5	1	2	21	6	5
30	17	127	2	2	2	1	1	5	5	.	.	.	.	.	4	4	.	.	.	4	4	1	1	4	4	1	1	1	4	1	1	1	2	5
31	17	127	2	3	1	1	1	5	5	5	3	4	1	1	3	5	4	1	2	5	5	2	1	5	5	2	1	1	3	1	1	1	7	5
32	18	130	1	2	5	3	4	3	1	1	3	3	1	5	1	2	3	4	5	2	5	2	1	5	5	2	1	1	5	1	2	3	2	5
33	18	130	1	3	3	2	1	4	5	3	2	4	1	5	.	1	5	1	3	4	5	2	1	5	5	2	1	1	5	1	2	3	6	5
34	19	132	1	4	3	1	1	5	5	5	1	1	1	5	2	4	3	1	2	4	4	1	1	5	4	2	1	1	5	1	2	12	3	5
35	19	132	1	5	3	2	1	5	4	4	1	2	1	4	2	4	4	2	2	4	4	1	1	5	5	2	1	1	5	1	2	12	8	4
36	20	132	2	4	2	1	1	5	4	4	3	1	1	2	1	4	5	4	2	5	5	2	1	5	4	1	1	1	5	1	2	12	3	5
37	20	132	2	5	2	1	1	1	5	4	2	1	1	3	1	4	5	4	3	4	4	1	1	5	5	1	1	1	4	1	2	12	8	.
38	21	133	1	2	2	3	2	2	3	4	2	3	1	2	3	4	3	1	2	5	5	3	2	5	3	4	2	2	5	1	1	2	0	5
39	21	133	1	2	3	3	3	3	3	5	2	5	2	2	3	5	3	2	2	4	4	2	1	5	4	4	2	1	4	1	1	2	4	5
40	22	133	2	2	2	3	3	3	3	5	1	5	1	3	3	3	5	3	2	5	4	2	2	4	4	4	2	2	4	1	1	2	0	5
41	22	133	2	2	3	3	3	3	3	5	1	5	1	1	5	3	3	1	1	5	4	2	2	4	4	4	2	2	4	1	1	2	4	5
42	23	134	1	4	3	2	1	5	5	5	2	3	2	4	.	3	3	2	1	4	3	2	1	5	3	2	3	1	4	1	2	13	0	4

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
43	23	134	1	4	3	2	1	5	5	4	3	2	1	3	1	4	4	3	2	4	4	2	1	5	2	2	1	1	4	1	2	13	2	5
44	24	134	2	4	2	2	1	5	5	4	1	3	1	3	2	4	4	2	2	5	4	2	2	5	2	2	2	1	4	1	2	13	0	4
45	24	134	2	4	1	1	1	5	5	3	1	3	1	4	3	4	4	3	2	5	4	2	2	5	4	2	1	1	4	1	2	13	2	5
46	25	136	1	2	3	1	1	5	5	5	2	3	1	4	1	5	5	3	1	5	5	2	2	5	4	4	1	2	5	1	1	2	1	5
47	26	136	2	2	3	2	1	4	5	5	1	1	1	3	1	3	3	3	1	2	5	1	1	4	3	1	1	1	5	1	1	3	0	5
48	27	139	1	5	4	4	4	3	3	4	4	1	5	4	3	3	3	1	4	2	5	4	4	5	5	5	4	3	1	1	2	9	1	4
49	28	148	1	2	3	3	4	3	5	5	2	3	1	3	1	4	4	1	1	5	5	1	1	5	5	2	1	1	5	1	1	2	1	5
50	29	182	1	7	3	3	5	5	5	3	2	4	1	4	5	4	4	3	2	4	5	4	3	5	5	3	1	1	4	1	2	30	2	4
51	30	183	1	3	3	1	1	5	4	3	1	1	1	4	1	3	4	1	1	4	4	4	1	5	5	1	1	1	5	1	2	6	0	4
52	31	183	2	3	3	2	1	5	5	5	1	1	1	3	2	3	3	2	3	5	4	3	2	5	4	2	2	2	4	1	2	7	1	5
53	32	189	1	2	2	1	1	4	5	3	1	1	1	5	3	4	3	1	1	5	5	1	1	5	5	2	2	2	4	1	1	2	1	5
54	33	189	2	2	2	1	1	4	5	2	1	1	1	5	3	5	5	1	1	4	5	1	1	5	5	1	1	1	5	1	1	3	1	5
55	34	201	1	4	.	1	1	3	5	5	2	5	1	4	1	3	3	1	1	4	4	2	2	5	5	3	2	2	4	2	2	3	12	4
56	34	201	1	5	2	1	1	3	4	4	4	4	1	4	1	2	3	1	1	.	4	4	2	4	4	3	1	2	4	2	2	3	16	4

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTU	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
57	34	201	1	5	1	2	1	3	4	3	2	4	1	4	1	3	4	1	1	4	4	2	2	5	3	4	2	2	4	2	2	3	20	4
58	35	202	1	2	.	4	1	5	5	4	1	1	1	2	2	4	3	3	2	4	4	4	4	3	3	3	3	2	4	2	2	3	3	4
59	35	202	1	3	3	3	1	5	5	3	2	2	2	3	1	4	3	2	1	4	4	3	3	4	3	2	2	2	4	2	2	3	7	4
60	36	203	1	5	3	2	3	4	5	5	3	1	1	5	1	4	4	1	1	4	5	2	1	5	4	1	1	2	5	2	1	2	18	5
61	37	203	2	5	2	3	2	3	4	4	2	1	2	1	1	3	3	2	1	4	4	2	1	4	4	2	2	2	4	2	1	2	18	5
62	38	204	1	6	2	1	1	5	5	5	1	1	1	3	1	4	4	3	2	4	4	4	1	5	2	2	1	1	4	2	1	2	24	5
63	38	204	1	7	1	1	1	5	5	5	1	1	1	3	1	3	3	4	1	5	5	4	1	5	1	1	1	1	5	2	1	2	28	5
64	38	204	1	7	1	1	1	5	5	5	1	1	1	3	1	3	3	5	3	5	5	4	1	5	1	1	1	1	5	2	1	2	33	5
65	39	204	2	6	2	3	.	.	5	.	.	.	.	.	.	.	.	.	.	4	4	2	2	4	3	2	2	3	4	2	1	2	24	5
66	39	204	2	7	1	1	1	3	5	3	1	1	1	1	1	5	4	5	2	4	4	2	2	4	2	2	2	2	4	2	1	2	28	5
67	39	204	2	7	1	1	1	1	5	5	1	1	1	3	1	5	4	5	2	5	5	4	1	5	1	1	1	1	5	2	1	2	33	5
68	40	205	1	7	1	1	1	4	5	5	1	1	1	3	1	5	5	1	1	5	5	1	1	5	5	1	1	1	5	2	2	29	3	4
69	40	205	1	8	3	2	1	2	4	4	2	1	1	2	1	4	4	4	4	3	5	2	1	5	4	3	1	1	5	2	2	29	9	4
70	40	205	1	8	4	1	1	3	5	4	2	1	1	3	1	4	4	3	1	4	5	1	1	5	3	1	1	1	5	2	2	29	12	5

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
71	41	205	2	7	2	1	1	4	5	5	2	1	1	4	1	4	4	3	2	5	4	5	1	5	5	1	1	1	4	2	2	29	3	5
72	41	205	2	8	3	2	2	3	5	5	3	1	2	3	1	4	4	3	3	5	5	2	1	5	4	2	1	1	5	2	2	29	9	5
73	41	205	2	8	4	2	2	3	5	5	3	1	2	2	1	4	3	3	2	4	5	1	1	5	4	1	1	1	5	2	2	29	12	5
74	42	206	3	6	1	1	1	3	5	5	3	5	1	4	1	5	4	3	1	4	3	4	5	5	5	4	5	1	5	2	2	6	21	5
75	43	207	1	7	1	4	3	2	3	3	4	1	1	4	1	3	3	2	2	4	4	5	2	5	5	3	2	1	3	2	1	3	30	4
76	44	207	2	6	2	3	1	1	2	3	1	1	1	1	1	2	1	1	1	4	4	4	2	4	5	2	2	2	4	2	1	3	26	5
77	45	209	1	4	2	1	2	5	5	4	1	4	1	4	2	4	4	1	2	4	5	1	1	5	4	1	1	1	4	2	2	3	15	5
78	45	209	1	5	1	1	1	5	5	4	2	2	1	2	1	4	4	1	1	5	5	1	1	5	5	1	1	1	5	2	2	3	18	5
79	45	209	1	6	3	1	3	4	5	4	2	2	1	3	2	4	4	2	2	4	4	1	2	5	5	2	1	2	5	2	2	3	22	5
80	46	213	1	4	1	3	1	1	.	.	.	.	.	3	.	2	.	.	.	4	3	2	4	5	5	4	1	1	2	2	2	2	14	3
81	47	214	1	3	2	1	3	3	5	5	2	1	1	3	1	4	2	3	3	3	5	2	1	5	4	2	.	1	4	2	1	1	11	5
82	48	214	2	3	2	2	3	4	4	5	2	1	1	2	1	3	4	3	3	4	4	1	1	5	4	2	1	1	5	2	1	1	11	5
83	49	215	1	4	2	1	1	5	5	4	2	3	1	3	1	5	4	1	3	5	5	2	1	5	5	5	1	1	5	2	2	2	13	5
84	49	215	1	5	2	1	2	5	5	5	1	2	1	3	1	4	3	1	2	5	5	4	2	5	5	.	3	1	5	2	2	2	18	5

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINUSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
85	50	215	2	4	2	1	1	5	5	4	2	3	1	3	1	5	4	1	3	5	5	2	1	5	5	5	1	1	5	2	2	2	13	5
86	51	217	1	6	3	2	1	3	2	4	4	3	2	3	1	5	3	2	2	3	5	2	2	5	5	2	1	1	5	2	2	11	16	4
87	51	217	1	6	4	4	2	3	4	5	2	3	1	3	1	5	3	2	3	4	5	2	1	5	4	3	3	1	5	2	2	11	20	4
88	52	217	2	6	2	2	1	3	5	5	2	2	2	5	1	4	4	4	1	4	5	2	2	5	4	3	2	1	5	2	2	11	16	5
89	52	217	2	6	2	1	2	5	5	5	3	3	3	3	1	2	4	3	2	4	5	2	2	4	4	2	2	2	4	2	2	11	20	4
90	53	218	1	5	1	1	1	3	4	3	3	4	1	2	1	5	4	1	2	4	4	1	1	5	5	2	2	1	4	2	2	10	11	4
91	54	219	1	6	.	4	4	4	2	5	2	5	.	.	2	3	2	3	3	.	4	5	3	5	5	5	4	5	4	2	2	21	6	2
92	55	219	2	6	4	5	3	1	3	4	3	5	1	4	1	4	5	3	3	4	5	2	4	5	5	4	2	4	4	2	2	21	6	3
93	56	221	1	3	4	2	2	4	4	3	2	5	1	5	1	5	4	2	2	2	4	3	4	4	5	5	3	4	4	2	2	7	2	4
94	56	221	1	4	3	1	2	5	4	2	1	5	1	4	1	4	3	2	2	2	4	2	5	4	5	4	3	4	4	2	2	7	7	5
95	57	221	2	3	3	2	2	4	3	4	1	5	1	3	1	4	4	1	1	4	4	2	4	5	3	2	1	3	4	2	2	8	2	5
96	58	223	1	2	3	3	1	5	5	3	1	2	1	3	1	4	4	1	2	5	5	2	2	5	5	4	2	2	4	2	1	2	3	5
97	58	223	1	3	2	2	1	4	5	3	2	3	2	2	1	4	4	4	2	4	4	2	3	5	4	3	2	3	5	2	1	2	6	4
98	59	223	2	2	2	2	2	5	5	4	3	2	1	3	3	4	4	2	2	5	4	2	1	4	2	2	2	1	4	2	1	2	3	4

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
99	59	223	2	3	3	1	1	5	5	5	2	2	2	3	1	4	4	3	3	4	4	2	3	5	4	4	2	5	4	2	1	2	6	4
100	60	222	1	3	2	.	.	5	5	5	3	3	1	2	1	3	3	1	3	.	4	4	3	4	4	2	1	1	4	2	1	1	10	3
101	61	224	1	2	3	2	2	5	3	4	1	1	2	2	1	3	2	1	1	4	.	4	2	3	.	4	4	2	4	2	1	2	4	4
102	61	224	1	3	3	2	1	4	3	3	1	1	2	3	2	3	3	1	2	4	4	4	3	4	4	3	4	2	4	2	1	2	9	3
103	61	224	1	4	2	3	2	5	4	4	1	1	2	2	1	3	4	1	2	5	4	4	4	4	3	2	2	2	4	2	1	2	14	4
104	62	224	2	2	3	2	1	5	4	3	3	2	1	3	1	2	3	1	2	4	4	1	2	5	3	3	1	1	5	2	1	2	4	5
105	62	224	2	3	3	3	1	3	4	3	2	1	2	3	1	3	3	1	2	4	4	4	3	4	3	3	2	2	4	2	1	2	9	3
106	62	224	2	4	2	2	1	1	.	.	2	2	1	3	1	4	3	2	2	4	4	2	4	5	4	2	1	1	4	2	1	2	14	5
107	63	225	1	3	1	2	2	5	5	5	2	5	2	4	1	4	4	1	3	5	5	1	1	5	5	4	2	1	5	2	1	0	6	5
108	64	225	2	3	3	3	2	5	5	5	3	5	3	3	1	5	4	1	3	4	4	2	2	5	3	2	1	1	4	2	1	0	6	5
109	65	229	1	5	2	2	1	5	5	4	2	3	2	4	4	4	4	3	2	4	5	3	1	5	2	4	1	2	5	2	2	15	6	5
110	66	229	2	5	2	1	1	5	5	4	2	2	2	4	3	4	4	3	2	2	4	2	5	5	2	2	5	2	4	2	2	15	6	5
111	67	230	1	5	3	2	3	5	5	4	3	2	1	3	1	2	2	3	1	5	5	2	2	5	5	5	2	4	4	2	2	1	5	4
112	67	230	1	6	2	2	3	5	5	4	1	2	1	2	3	4	4	1	2	2	5	5	1	5	5	5	1	4	4	2	2	1	10	4

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGES	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
113	67	230	1	7	2	3	3	5	5	3	2	1	2	.	2	4	4	1	1	2	5	2	2	5	4	5	1	4	5	2	2	1	12	4
114	68	230	2	5	4	4	4	5	2	2	3	.	1	3	1	4	3	1	5	4	5	2	3	5	5	4	2	2	4	2	2	1	5	5
115	68	230	2	6	3	2	3	5	4	3	2	1	2	4	.	4	3	1	4	5	5	4	4	3	4	3	2	2	4	2	2	1	10	.
116	68	230	2	7	2	2	2	4	3	2	3	1	1	3	3	3	3	1	4	.	4	2	3	4	4	2	2	2	4	2	2	1	12	.
117	69	231	1	5	2	2	1	5	5	5	1	3	1	5	1	4	4	1	2	4	4	1	1	5	4	1	1	1	5	2	1	1	22	5
118	69	231	1	6	3	1	1	5	5	5	1	4	1	4	1	5	5	1	1	4	4	1	1	5	4	1	1	1	5	2	1	1	26	5
119	70	231	2	5	2	2	1	4	5	5	1	4	1	4	1	4	4	1	1	5	5	2	1	5	2	2	1	1	5	2	1	1	22	5
120	70	231	2	6	2	1	1	5	5	5	1	5	1	4	1	5	5	1	1	5	5	2	1	3	2	2	1	1	5	2	1	1	26	.
121	71	232	1	5	2	1	2	5	5	5	3	5	1	5	2	4	4	3	2	2	4	2	4	5	4	4	1	1	5	2	1	2	16	5
122	71	232	1	7	3	2	2	5	5	5	3	4	1	3	1	4	4	1	3	4	4	4	2	2	4	2	2	2	4	2	1	2	28	5
123	72	232	2	5	3	2	1	5	5	4	2	5	1	2	2	4	4	1	1	5	4	2	2	5	4	3	1	1	2	2	1	2	22	5
124	72	232	2	7	3	2	2	5	5	5	2	5	1	2	1	5	4	2	1	5	4	4	2	5	5	5	1	1	5	2	1	2	26	5
125	73	234	1	6	3	3	3	5	5	4	3	1	1	5	3	4	4	1	2	4	4	4	2	4	5	2	2	4	2	2	1	0	29	3
126	73	234	1	7	2	3	3	5	5	4	1	1	1	4	2	3	3	1	2	4	4	4	4	4	5	2	2	2	4	2	1	0	34	3

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
127	74	234	2	6	2	2	2	5	5	3	2	1	1	5	3	4	5	3	2	5	5	5	4	4	5	4	3	3	3	2	1	0	29	3
128	74	234	2	7	1	2	1	5	5	5	1	4	1	5	2	5	5	4	2	4	5	4	4	5	4	2	2	4	4	2	1	0	34	4
129	75	235	1	5	2	2	3	2	3	2	1	1	1	5	5	5	5	1	1	.	5	3	1	4	5	4	2	1	5	2	2	12	4	5
130	75	235	1	5	2	5	4	4	2	5	4	1	1	5	5	3	4	1	3	.	4	2	4	5	5	5	5	4	4	2	2	12	8	3
131	75	235	1	6	5	5	5	4	5	4	4	2	2	5	5	2	3	2	4	5	3	5	5	5	5	5	3	3	5	2	2	12	12	3
132	76	235	2	5	2	2	4	1	3	5	1	1	1	3	2	5	5	1	3	4	5	1	2	5	5	1	1	1	5	2	2	12	4	4
133	76	235	2	5	4	2	4	3	2	4	1	5	5	3	3	4	4	3	2	.	4	5	2	5	3	1	1	1	2	2	2	12	8	5
134	76	235	2	6	3	4	4	4	5	4	3	3	3	5	.	4	2	1	1	4	4	4	2	5	5	4	1	4	5	2	2	12	12	4
135	77	236	1	5	2	.	1	5	5	4	1	3	1	4	1	4	4	1	1	5	5	3	1	5	2	2	1	1	5	2	1	0	23	4
136	77	236	1	6	2	2	1	4	5	4	2	3	1	4	1	4	4	1	2	4	4	4	2	4	4	2	1	1	5	2	1	0	29	5
137	78	236	2	5	2	2	1	4	3	3	1	3	1	4	2	2	4	1	2	5	4	2	2	5	4	2	1	1	5	2	1	0	23	5
138	78	236	2	6	2	1	1	5	4	3	1	3	1	3	1	3	3	1	2	5	5	2	2	5	4	3	1	1	5	2	1	0	29	4
139	79	301	5	5	4	3	4	5	4	3	1	1	1	2	1	4	2	4	2	4	5	2	1	4	5	5	1	4	4	3	.	.	0	.
140	79	301	5	6	4	3	3	1	3	2	1	1	2	.	1	1	2	4	3	1	3	4	3	4	4	4	3	3	4	3	.	.	0	.

```
                                                                  MORE

 N                                                                    E
 E      F     C   M     P R E R   F C   I R   P           R D C I   D N   H
 W      A   P H S A M F R E S E   R O A N E   H A A D C A E E O S   I T E A
 C    O M   A I T S U I O F C L D I U C T S U Y P C E O T S P N O   A R I P
 A    R I   R . R T T N B R A Y R E N C E T P H P C M M T T R F L   G Y P P
 S    I L   E A E E U S S A P G I N S O R L S L R E A P A R E L A E N A M Y
 E    G Y   N G S R A E O M T O N D E M S E E T E P N E C I S C T I O G O O
 #    # #   T E S Y L C L E V D K S L P T S T H C T D T H C S T N P S E S C

141  79 301 5 7 4 3 3 5 3 2 1 1 4 . 1 2 3 2 4 3 3 5 3 3 5 4 3 4 5 3 . . 0 .
142  80 309 1 8 2 2 1 1 5 5 1 4 1 5 1 4 4 1 1 5 5 1 1 5 5 1 1 1 5 3 . . 0 .
143  80 309 1 9 2 3 3 3 5 5 1 3 1 5 5 1 2 4 3 3 5 2 1 5 5 3 1 1 5 3 . . 0 .
144  81 321 1 5 2 2 1 1 5 5 1 1 1 4 1 4 4 1 1 5 4 4 1 5 5 1 1 1 5 3 . . 0 .
145  81 321 1 5 2 1 2 1 5 4 2 2 1 4 1 4 4 1 1 5 3 5 2 5 5 2 1 1 5 3 . . 0 .
146  81 321 1 6 2 2 1 1 5 5 2 1 1 2 1 2 2 1 1 2 3 4 1 5 4 1 5 1 5 3 . . 0 .
147  82 321 2 5 3 1 3 1 4 4 2 1 1 2 1 3 4 1 1 5 4 4 1 5 2 2 2 2 4 3 . . 0 .
148  82 321 2 5 3 2 3 2 5 4 2 1 1 2 1 3 4 1 1 5 3 4 1 5 2 1 1 1 4 3 . . 0 .
149  82 321 2 6 2 2 3 2 5 3 1 1 1 4 1 3 4 2 1 2 4 4 1 5 2 1 1 1 4 3 . . 0 .
150  83 324 1 5 2 2 4 5 2 4 1 1 2 1 1 1 2 4 2 5 4 5 3 5 5 5 4 5 1 3 . . 0 .
151  83 324 1 6 3 2 4 5 3 4 1 1 2 2 1 3 2 3 1 4 4 4 3 4 5 4 4 5 4 3 . . 0 .
152  83 324 1 7 2 1 5 5 3 4 1 1 2 2 1 2 2 1 1 1 4 4 3 5 5 5 4 5 1 3 . . 0 .
153  84 324 2 5 2 1 3 5 5 4 2 1 2 1 1 4 3 3 3 4 4 2 1 5 4 4 2 4 4 3 . . 0 .
154  84 324 2 6 3 2 3 5 5 4 2 1 2 1 1 4 3 2 3 4 4 2 2 5 4 4 2 3 3 3 . . 0 .
```

																															MORE			
NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLST	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
155	84	324	2	7	2	1	3	5	5	5	4	1	2	1	1	4	4	3	1	5	4	2	2	5	4	4	2	4	3	3	.	.	0	.
156	85	326	1	5	2	2	1	5	5	5	2	2	1	3	1	2	2	3	2	2	4	3	2	5	4	2	2	1	4	3	.	.	0	.
157	85	326	1	6	3	2	2	5	3	.	1	2	1	2	1	2	3	3	1	4	4	4	3	4	4	2	3	2	4	3	.	.	0	.
158	86	326	2	5	3	2	1	5	4	4	1	1	1	4	1	4	4	3	2	3	4	4	2	5	4	2	2	2	4	3	.	.	0	.
159	86	326	2	6	4	2	1	5	5	4	2	1	1	4	1	4	4	1	3	3	4	2	2	5	4	4	1	1	4	3	.	.	0	.
160	87	350	1	5	2	3	1	4	5	5	2	2	1	4	3	5	4	1	4	4	4	2	1	5	5	4	1	2	4	3	.	.	0	.
161	87	350	1	6	3	3	1	5	4	3	1	2	1	3	3	4	4	2	3	5	5	2	1	5	5	4	1	4	4	3	.	.	0	.
162	87	350	1	6	3	2	1	5	4	3	2	3	2	2	3	4	4	2	2	5	5	2	1	5	5	4	1	2	4	3	.	.	0	.
163	88	350	2	6	2	1	1	5	4	4	3	3	1	2	3	3	3	1	2	4	4	1	1	4	4	4	1	1	4	3	.	.	0	.
164	89	355	2	6	3	3	.	4	5	5	1	1	1	2	2	4	4	2	1	4	5	1	1	5	5	2	1	5	5	3	.	.	0	.
165	90	361	1	6	.	3	2	1	4	5	3	3	3	1	3	2	2	5	1	5	4	3	4	5	3	5	2	3	2	3	.	.	0	.
166	90	361	1	6	4	2	1	1	5	5	5	3	3	1	3	1	1	2	5	.	2	5	2	5	5	2	3	1	1	3	.	.	0	.
167	90	361	1	7	4	3	.	1	5	5	3	3	2	2	3	4	2	4	2	4	5	4	2	5	5	3	3	1	2	3	.	.	0	.
168	91	363	1	5	3	3	1	5	4	3	.	.	.	3	.	2	4	.	.	4	5	2	2	5	5	2	1	1	5	3	.	.	0	.

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
169	92	363	2	5	3	3	3	5	5	.	.	5	.	.	.	2	4	3	1	5	4	2	2	5	4	2	1	1	4	3	.	.	0	.
170	93	372	1	7	1	1	1	3	5	5	2	1	1	3	1	4	3	2	1	4	5	4	1	5	1	1	1	1	5	3	.	.	0	.
171	94	372	2	7	3	2	1	5	5	4	3	1	3	3	1	4	4	3	2	.	4	4	3	2	5	4	2	1	4	3	.	.	0	.
172	95	376	1	6	2	1	2	2	2	.	.	.	.	.	.	4	.	.	.	4	4	2	1	5	5	4	2	1	4	3	.	.	0	.
173	96	377	1	4	.	2	1	3	4	5	2	5	1	2	1	3	4	2	1	.	.	4	2	5	4	2	1	1	5	3	.	.	0	.
174	96	377	1	4	4	3	2	1	4	3	1	5	.	1	1	3	3	2	2	2	3	4	2	4	4	4	2	2	4	3	.	.	0	.
175	96	377	1	5	.	.	2	3	5	5	1	5	1	2	2	2	4	2	2	2	4	3	2	5	4	4	2	3	4	3	.	.	0	.
176	97	377	2	4	2	2	2	1	5	4	1	5	1	2	1	3	4	1	2	5	3	4	1	5	4	4	2	3	5	3	.	.	0	.
177	97	377	2	4	1	1	1	2	4	5	1	5	1	2	1	1	5	3	1	5	5	4	1	5	4	4	1	4	4	3	.	.	0	.
178	97	377	2	5	1	2	1	2	5	4	1	5	1	2	1	5	5	2	1	5	5	2	1	5	4	4	2	2	5	3	.	.	0	.
179	98	382	1	6	3	2	3	3	5	4	2	3	1	2	1	2	3	2	2	4	5	4	2	5	5	1	2	1	5	3	.	.	0	.
180	98	382	1	6	4	3	5	2	3	3	2	3	1	3	3	1	1	5	4	4	5	4	3	4	3	2	2	4	1	3	.	.	0	.
181	99	383	1	3	2	2	2	3	4	2	2	4	2	3	1	4	3	2	2	4	5	2	2	5	4	2	1	4	4	3	.	.	0	.
182	99	383	1	3	2	2	2	4	4	4	2	4	1	2	1	3	3	2	2	4	4	2	1	5	4	3	2	4	4	3	.	.	0	.

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
183	99	383	1	4	2	3	2	4	5	4	2	4	1	3	1	2	3	3	1	3	4	4	1	5	4	2	2	4	4	3	.	.	0	.
184	100	400	1	7	2	2	1	1	4	4	1	1	1	4	5	2	2	1	1	2	4	4	1	5	5	4	2	4	4	3	.	.	0	.
185	101	400	2	7	4	3	1	3	1	2	1	1	3	4	1	3	4	4	3	4	4	2	1	5	4	2	1	4	5	3	.	.	0	.
186	102	402	2	4	3	3	3	3	4	3	1	1	1	2	1	3	4	2	2	3	4	3	2	4	4	4	2	2	3	3	.	.	0	.
187	103	403	1	4	2	2	3	3	3	3	2	1	1	3	1	2	2	1	1	4	4	5	2	5	3	4	1	1	4	3	.	.	0	.
188	104	405	1	3	4	1	2	1	3	2	2	2	1	4	1	1	3	5	3	4	4	2	1	5	4	2	2	2	5	3	.	.	0	.
189	104	405	1	4	3	2	3	1	3	3	1	3	1	4	1	4	4	3	1	4	4	2	1	5	5	4	1	2	5	3	.	.	0	.
190	105	405	6	3	4	1	1	1	5	3	1	1	1	3	1	5	5	1	1	4	1	4	3	5	1	2	1	1	5	3	.	.	0	.
191	105	405	6	4	2	2	2	1	1	3	2	1	3	2	1	3	3	2	1	4	3	4	1	5	2	4	2	4	4	3	.	.	0	.
192	106	405	1	3	5	1	2	1	5	4	3	5	1	5	1	5	5	2	2	5	5	2	4	5	5	4	1	1	5	3	.	.	0	.
193	106	406	1	4	2	1	4	1	5	5	2	5	1	5	1	5	5	2	2	4	5	1	1	5	4	4	1	1	5	3	.	.	0	.
194	106	406	1	5	3	2	5	4	5	4	1	4	1	1	1	5	5	1	4	4	5	3	1	5	4	4	1	1	5	3	.	.	0	.
195	107	406	2	3	2	1	1	2	5	5	3	1	1	4	1	4	4	2	1	5	4	2	2	5	4	4	3	2	5	3	.	.	0	.
196	107	406	2	4	2	2	2	4	3	2	4	1	1	3	1	5	5	2	1	4	4	4	4	5	5	2	1	1	5	3	.	.	0	.

```
                                                                   MORE

 N                                                                    E
 E       F    C   M     P R E R   F C   I R   P           R D C I   D N   H
 W       A  P H S A M F R E S E   R O A N E   H A A D C A E E O S   I T E A
 C   O   M  A I T S U I O F C L D I U C T S U Y P C E O T S P N O   A R I P
 A   R   I  R . R T T N B R A Y R E N C E T P H P C M M T T R F L   G Y P P
 S   I   L  E A E E U S S A P G I N S O R L S L R E A P A R E L A E N A M Y
 E   G   Y  N G S R A E O M T O N D E M S E E T E P N E C I S C T I O G O O
 #   #   #  T E S Y L C L E V D K S L P T S T H C T D T H C S T N P S E S C

197 107 406 2 5 4 2 3 4 5 3 2 1 1 2 1 3 3 3 1 2 4 4 4 5 5 2 3 2 4 3 . . 0 .
198 108 408 7 5 1 1 2 4 4 4 1 2 1 1 1 5 4 1 1 5 4 3 1 5 5 2 1 1 4 3 . . 0 .
199 109 411 1 3 2 2 3 3 4 4 2 2 1 2 2 1 3 3 4 2 2 4 3 4 2 2 2 2 4 3 . . 0 .
200 109 411 1 4 3 2 2 4 4 5 1 1 1 5 4 3 2 3 2 4 4 2 1 5 2 2 2 2 4 3 . . 0 .
201 110 411 2 3 2 2 2 3 4 5 1 3 1 3 1 4 4 1 1 5 4 2 1 5 3 1 1 1 5 3 . . 0 .
202 110 411 2 4 3 2 2 1 3 4 2 2 1 3 1 4 4 2 1 . 5 5 3 1 4 1 1 1 4 3 . . 0 .
203 111 413 1 1 3 3 2 5 4 3 3 2 1 4 1 3 2 1 1 4 3 2 2 4 5 4 2 1 4 3 . . 0 .
204 111 413 1 2 2 2 1 5 5 4 2 2 1 5 1 . 3 1 3 2 4 2 1 5 5 4 2 1 4 3 . . 0 .
205 112 417 1 2 2 3 3 5 5 4 2 1 1 2 1 3 2 2 3 4 5 4 2 5 5 1 1 3 5 3 . . 0 .
206 113 417 2 2 2 2 2 2 4 3 1 1 2 1 1 3 2 3 2 4 5 4 2 5 2 2 1 1 5 3 . . 0 .
207 114 429 1 3 2 2 1 5 5 3 2 1 3 3 2 2 4 1 1 2 3 5 2 5 5 4 1 1 2 3 . . 0 .
208 114 429 1 4 3 2 1 4 5 4 1 1 2 2 1 5 5 2 1 2 5 5 4 5 4 2 2 2 4 3 . . 0 .
209 114 429 1 5 2 2 1 4 5 4 1 1 2 2 1 4 4 1 1 4 5 4 2 5 4 2 1 1 4 3 . . 0 .
210 115 429 2 3 3 3 1 5 5 2 2 1 3 3 2 2 3 1 1 4 3 5 2 5 5 4 1 1 4 3 . . 0 .
```

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
211	115	429	2	4	2	3	1	3	5	4	2	1	2	3	1	4	4	2	3	2	3	4	2	5	4	4	2	3	3	3	.	.	0	.
212	115	429	2	5	2	2	2	3	5	4	2	2	2	3	1	4	4	2	1	4	4	2	2	5	5	4	1	1	4	3	.	.	0	.
213	116	430	1	3	2	2	2	4	5	5	1	2	1	1	1	3	3	2	1	5	4	2	1	5	5	2	1	1	5	3	.	.	0	.
214	116	430	1	4	3	2	2	3	5	1	1	3	1	1	1	3	3	2	1	5	5	1	1	5	4	2	1	1	5	3	.	.	0	.
215	116	430	1	5	2	2	2	3	5	1	1	1	1	1	1	3	4	2	1	4	4	4	1	5	5	1	1	1	5	3	.	.	0	.
216	117	430	2	3	3	3	2	2	3	2	2	2	1	3	1	2	2	3	4	3	5	1	1	5	5	1	1	1	5	3	.	.	0	.
217	117	430	2	4	2	3	2	3	3	2	2	1	1	1	1	2	3	2	2	4	5	1	1	5	4	2	1	1	4	3	.	.	0	.
218	117	430	2	5	2	2	2	2	.	4	3	2	1	2	1	3	3	3	3	4	5	2	1	5	4	4	1	3	5	3	.	.	0	.
219	118	432	1	3	2	1	2	4	4	3	1	3	1	4	1	5	4	1	1	4	4	1	1	5	4	2	1	2	4	3	.	.	0	.
220	118	432	1	4	3	3	2	4	4	4	1	2	1	3	1	3	2	3	3	4	3	3	1	5	4	4	2	2	3	3	.	.	0	.
221	118	432	1	4	1	1	1	3	4	3	1	2	1	2	1	3	2	1	1	4	4	2	2	5	4	2	1	2	4	3	.	.	0	.
222	119	432	2	3	3	3	3	5	5	3	1	1	3	1	1	3	2	1	4	3	4	2	2	4	2	2	1	4	1	3	.	.	0	.
223	119	432	2	4	4	3	2	5	5	4	1	1	1	1	1	3	2	1	4	2	4	1	1	4	3	5	2	5	2	3	.	.	0	.
224	119	432	2	4	3	1	3	5	4	2	3	2	2	1	1	3	2	1	2	4	5	2	2	4	2	4	1	4	4	3	.	.	0	.

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRES	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
225	120	436	1	5	5	3	4	5	3	3	4	2	2	3	2	3	2	4	1	4	4	4	3	5	4	3	2	2	2	3	.	.	0	.
226	120	436	1	6	3	3	4	5	3	5	2	1	2	3	1	3	3	4	2	4	4	2	1	5	4	3	2	3	4	3	.	.	0	.
227	120	436	1	6	4	3	4	4	4	4	2	3	1	3	3	2	2	4	2	4	3	4	2	5	3	3	3	2	4	3	.	.	0	.
228	121	436	2	5	4	2	2	5	3	5	4	2	1	1	2	4	4	2	2	5	4	2	1	5	5	4	1	4	5	3	.	.	0	.
229	121	436	2	6	4	3	2	5	3	4	4	2	1	2	2	4	3	3	2	4	4	3	1	5	4	4	2	2	4	3	.	.	0	.
230	121	436	2	7	3	2	2	5	5	3	4	1	1	2	1	4	4	3	2	5	4	4	1	5	4	2	2	1	5	3	.	.	0	.
231	122	438	1	5	4	3	3	5	3	4	2	4	3	4	2	2	2	4	4	4	4	2	3	5	4	2	2	4	4	3	.	.	0	.
232	122	438	1	6	3	4	3	3	4	4	3	4	4	3	3	3	3	3	2	4	3	4	4	5	5	3	3	4	5	3	.	.	0	.
233	122	438	1	7	3	3	2	4	4	4	3	4	1	4	3	4	4	4	2	2	4	4	3	5	4	2	4	3	4	3	.	.	0	.
234	123	438	2	5	4	4	2	3	4	4	4	3	4	2	1	2	2	2	2	4	3	2	2	4	4	5	1	4	4	3	.	.	0	.
235	123	438	2	6	3	3	3	3	4	4	3	3	3	3	1	4	4	4	1	.	3	2	4	4	2	4	2	4	2	3	.	.	0	.
236	123	438	2	7	3	2	2	3	4	4	2	2	3	2	1	2	3	3	1	4	3	4	4	4	4	.	1	3	4	3	.	.	0	.
237	124	441	1	3	2	2	1	3	2	2	3	1	2	1	1	3	3	4	3	4	4	.	1	5	4	4	1	2	4	3	.	.	0	.
238	125	441	2	3	1	1	1	3	5	4	3	1	2	1	1	4	4	1	1	5	4	2	3	5	4	2	1	1	4	3	.	.	0	.

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
239	126	456	1	6	2	1	1	4	5	4	3	1	3	3	1	4	4	3	2	4	4	1	1	5	5	2	1	1	4	3	.	.	0	.
240	126	456	1	7	2	2	1	4	5	4	4	1	2	2	1	3	4	2	2	4	4	4	2	5	4	2	1	1	5	3	.	.	0	.
241	127	456	2	6	1	1	1	5	5	4	2	1	2	2	1	4	4	2	1	5	4	1	1	5	5	5	1	1	5	3	.	.	0	.
242	127	456	2	8	2	2	1	5	5	2	2	1	2	2	1	5	5	1	1	5	4	1	1	5	5	4	1	3	5	3	.	.	0	.
243	128	462	1	4	2	1	2	4	5	3	3	3	1	2	1	4	4	1	2	4	4	2	2	5	4	2	2	2	3	3	.	.	0	.
244	128	462	1	5	2	1	2	4	5	4	2	4	4	2	.	4	4	2	2	4	4	2	2	5	5	4	1	1	3	3	.	.	0	.
245	128	462	1	5	1	1	1	5	5	4	3	2	1	1	1	4	4	3	2	4	3	4	3	5	5	2	1	2	4	3	.	.	0	.
246	129	462	2	4	2	1	2	5	5	4	1	2	1	2	1	4	3	2	1	3	3	2	1	5	4	4	2	1	4	3	.	.	0	.
247	129	462	2	5	2	1	3	5	5	5	1	2	1	1	1	5	5	1	2	4	3	4	1	5	4	3	3	3	4	3	.	.	0	.
248	129	462	2	5	2	1	2	5	4	4	2	2	1	1	1	4	3	1	1	4	3	4	2	5	5	3	2	1	5	3	.	.	0	.
249	130	463	1	6	1	1	1	1	5	4	1	5	1	3	1	5	5	4	1	.	5	5	2	1	5	1	1	1	5	3	.	.	0	.
250	130	463	1	6	2	1	1	5	4	5	1	5	1	3	1	3	5	5	2	4	5	2	2	5	4	1	1	1	4	3	.	.	0	.
251	130	463	1	7	2	1	1	4	4	4	1	4	1	3	1	4	5	3	2	5	5	1	1	5	4	1	1	1	4	3	.	.	0	.
252	131	465	1	4	2	3	3	3	4	5	2	1	1	3	1	4	5	3	2	4	4	4	1	5	2	2	2	1	5	3	.	.	0	.

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRES	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPPMOS	HAPPYOC
253	131	465	1	5	2	2	3	2	5	4	3	1	1	2	1	3	4	2	2	4	4	4	1	5	3	1	1	1	5	3	.	.	0	.
254	131	465	1	6	2	2	3	2	3	4	3	1	1	3	1	3	4	4	3	4	4	4	2	5	3	2	2	2	4	3	.	.	0	.
255	132	465	2	4	2	1	2	3	5	5	4	1	1	1	1	3	2	4	1	4	4	4	1	4	3	2	2	2	3	3	.	.	0	.
256	132	465	2	5	2	2	2	4	4	4	3	1	1	1	1	3	3	4	1	4	4	4	2	4	3	1	1	1	4	3	.	.	0	.
257	132	465	2	6	3	3	3	3	4	4	3	1	1	1	1	2	2	3	2	3	4	4	2	5	3	4	2	2	4	3	.	.	0	.
258	133	493	2	4	2	1	1	5	5	3	3	1	1	2	1	3	2	1	2	5	3	4	4	5	4	3	1	1	4	3	.	.	0	.
259	134	494	1	4	4	4	3	5	4	4	1	1	1	5	1	1	1	1	3	4	4	4	2	3	5	2	2	4	4	3	.	.	0	.
260	134	494	1	5	4	4	4	5	5	5	2	1	1	1	1	1	1	1	1	4	4	4	2	3	3	2	2	4	4	3	.	.	0	.
261	134	494	1	5	2	3	2	5	5	4	1	1	1	3	1	2	2	1	3	4	4	4	2	4	3	2	1	2	4	3	.	.	0	.
262	135	494	2	4	.	2	2	1	3	2	1	1	1	2	1	2	2	1	2	.	4	4	3	5	4	3	2	4	4	3	.	.	0	.
263	135	494	2	5	2	1	1	5	5	4	2	1	2	1	1	3	4	5	1	.	4	4	4	1	5	4	1	4	4	3	.	.	0	.
264	135	494	2	6	2	1	1	4	4	4	1	3	1	1	1	3	2	1	1	4	4	4	1	5	5	1	1	4	4	3	.	.	0	.
265	136	495	1	3	3	2	2	4	4	4	3	1	1	4	1	4	3	1	2	2	4	2	1	5	4	2	1	2	4	3	.	.	0	.
266	136	495	1	4	2	1	1	4	5	3	3	1	1	4	1	4	4	2	3	2	4	2	2	5	4	2	2	2	5	3	.	.	0	.

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
267	136	495	1	5	3	2	1	4	5	4	3	1	1	4	1	4	4	2	1	1	5	2	1	5	4	2	1	2	5	3	.	.	0	.
268	137	495	2	3	3	1	1	4	4	4	1	1	1	3	1	4	4	1	3	5	5	2	1	5	2	2	2	2	4	3	.	.	0	.
269	137	495	2	4	2	2	1	5	4	4	3	1	1	3	1	5	5	3	1	5	5	1	1	5	4	2	2	2	5	3	.	.	0	.
270	137	495	2	5	4	1	1	4	4	3	3	1	1	2	1	5	4	2	2	5	4	2	1	5	4	1	1	1	4	3	.	.	0	.
271	138	500	1	4	4	2	1	5	5	4	4	4	3	4	1	4	4	4	2	5	4	4	4	5	4	5	2	1	4	3	.	.	0	.
272	138	500	1	5	3	2	1	5	4	4	3	2	2	3	1	4	4	4	1	5	4	3	2	5	4	4	2	2	4	3	.	.	0	.
273	138	500	1	6	4	2	1	4	4	4	3	2	2	2	1	4	4	4	1	5	5	2	2	5	4	4	2	2	5	3	.	.	0	.
274	139	500	2	4	2	1	1	5	5	.	3	1	3	3	1	5	5	3	1	4	4	4	2	5	4	2	2	2	4	3	.	.	0	.
275	139	500	2	5	2	2	1	5	5	4	1	1	2	2	1	4	4	1	1	4	4	3	1	5	4	4	2	2	4	3	.	.	0	.
276	139	500	2	6	3	2	1	5	1	2	3	1	3	2	1	3	3	1	1	4	4	2	1	5	4	2	2	2	5	3	.	.	0	.
277	140	503	1	6	3	2	1	5	4	4	3	2	1	3	2	3	4	1	2	2	5	2	1	5	5	2	1	1	4	3	.	.	0	.
278	140	503	1	6	3	3	1	5	4	5	3	2	1	3	2	3	4	3	2	4	5	2	1	5	5	4	1	1	4	3	.	.	0	.
279	140	503	1	7	3	2	1	5	5	5	2	2	1	3	2	4	4	1	2	4	5	1	1	5	4	2	1	1	4	3	.	.	0	.
280	141	512	1	4	2	2	1	5	5	5	2	3	2	2	1	.	4	2	1	4	4	4	1	5	4	2	1	1	4	3	.	.	0	.

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRES	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPMOS	HAPPYOC
281	142	514	1	3	4	3	2	4	5	5	3	3	1	3	1	3	4	2	2	5	5	2	1	5	5	1	1	1	5	3	.	.	0	.
282	142	514	1	4	4	2	1	3	5	5	3	3	1	3	1	4	3	3	3	4	5	4	1	5	5	1	1	1	5	3	.	.	0	.
283	142	514	1	4	3	1	1	4	4	4	4	3	1	3	1	4	3	2	1	4	5	4	1	5	5	2	1	1	5	3	.	.	0	.
284	143	514	2	3	3	2	1	4	4	5	4	2	1	2	1	4	4	4	2	3	5	4	1	5	3	4	3	1	4	3	.	.	0	.
285	143	514	2	4	3	2	3	4	4	3	4	2	1	3	1	4	5	2	1	2	4	4	2	5	3	4	1	1	4	3	.	.	0	.
286	143	514	2	4	4	3	1	3	4	3	4	4	1	2	1	3	3	1	1	2	4	4	3	4	3	2	2	2	3	3	.	.	0	.
287	144	515	1	4	2	2	1	5	5	4	3	1	1	2	1	2	2	3	1	5	5	1	1	5	4	4	1	2	5	3	.	.	0	.
288	144	515	1	5	3	4	3	5	5	5	1	1	1	1	1	1	3	1	3	5	5	1	1	4	5	4	1	4	4	3	.	.	0	.
289	144	515	1	6	3	2	2	5	4	4	1	1	1	2	1	3	3	1	2	5	4	4	1	5	5	4	2	2	4	3	.	.	0	.
290	145	515	2	4	2	2	4	5	4	4	1	1	1	1	1	1	2	1	1	4	5	2	1	5	4	2	1	1	4	3	.	.	0	.
291	145	515	2	5	2	3	4	5	5	4	2	1	1	1	1	3	2	1	1	5	4	4	1	5	5	2	1	1	4	3	.	.	0	.
292	145	515	2	6	3	3	4	5	4	3	4	1	1	1	1	4	2	1	1	4	3	3	1	5	3	1	1	1	2	3	.	.	0	.
293	146	516	1	4	2	2	5	5	3	4	1	1	1	2	1	4	3	3	1	4	5	1	1	5	4	2	1	2	4	3	.	.	0	.
294	147	521	1	5	3	2	1	5	5	4	2	2	3	1	1	3	2	3	3	2	4	3	1	5	1	4	2	1	4	3	.	.	0	.

MORE

NEWCASE#	ORIG#	FAMILY#	PARENT	CHI.AGE	STRESS	MASTERY	MUTUAL	FINSEC	PROBSOL	REFRAME	ESCAPTV	RELYGOD	DRINK	FRIENDS	COUNSEL	ACCOMP	INTERST	RESTLES	UPSET	PHYHLTH	APPREC	ACCEPT	DEMAND	COMPET	ATTACH	RESTRIC	DEPRESS	CONFLCT	ISOLATN	EIP	DIAGNOS	ENTRYAGE	EIPPMOS	HAPPYOC
295	147	521	1	5	2	3	1	4	4	5	3	3	2	1	1	3	2	2	3	.	2	4	2	5	1	2	3	2	4	3	.	.	0	.
296	148	521	2	5	3	3	1	5	4	3	3	1	2	2	1	3	5	1	1	2	4	4	2	4	5	2	2	3	2	3	.	.	0	.
297	148	521	2	5	2	2	1	5	4	4	3	1	3	3	1	3	4	1	1	.	4	4	4	4	5	2	2	1	2	3	.	.	0	.
298	149	538	1	7	2	2	2	4	4	3	1	1	2	1	1	4	4	3	2	5	5	4	2	4	4	2	2	2	4	3	.	.	0	.
299	149	538	1	8	3	1	1	3	5	3	3	1	1	1	1	4	4	3	1	3	4	4	1	5	4	4	1	2	4	3	.	.	0	.
300	150	541	1	6	1	1	1	5	5	5	1	1	1	1	1	4	4	2	2	5	4	3	2	5	4	4	1	4	5	3	.	.	0	.
301	150	541	1	7	1	1	1	5	5	5	1	1	1	1	1	4	4	2	2	5	4	3	1	5	5	3	1	3	5	3	.	.	0	.
302	150	541	1	7	1	1	1	4	5	5	1	1	1	1	1	4	4	1	1	5	4	2	1	5	5	2	1	1	5	3	.	.	0	.
303	151	543	1	6	3	2	2	2	3	3	1	1	1	2	1	2	2	1	4	2	4	3	2	5	4	4	3	4	4	3	.	.	0	.
304	151	543	1	7	3	3	3	4	4	4	1	1	1	2	1	4	4	1	3	5	4	4	1	5	2	4	2	4	4	3	.	.	0	.
305	152	543	2	6	2	2	1	4	5	3	1	1	1	2	1	4	4	2	1	5	4	2	1	5	4	2	1	4	4	3	.	.	0	.
306	152	543	2	7	2	1	2	5	5	4	1	1	1	3	1	4	4	2	2	4	4	2	2	5	4	2	1	4	4	3	.	.	0	.
307	153	546	1	4	2	1	1	5	5	4	1	1	1	2	1	4	3	3	1	4	4	2	1	5	5	2	1	1	5	3	.	.	0	.
308	153	546	1	5	1	1	1	5	5	4	1	1	1	2	1	5	5	2	1	5	5	4	1	5	5	2	1	1	5	3	.	.	0	.

```
                                                                      MORE

 N                                                                       E
 E         F    C   M     P R E R   F C   I R   P           R D C I   D  N    H
 W         A  P H S A M F R E S E   R O A N E   H A A D C A E E O S   I  T  E A
 C    O    M  A I T S U I O F C L D I U C T S U Y P C E O T S P N O   A  R  I P
 A    R    I  R . R T T N B R A Y R E N C E T P H P C M M T T R F L   G  Y  P P
 S    I    L  E A E E U S S A P G I N S O R L S L R E A P A R E L A E N  A  M Y
 E    G    Y  N G S R A E O M T O N D E M S E E T E P N E C I S C T I O  G  O O
 #    #    #  T E S Y L C L E V D K S L P T S T H C T D T H C S T N P S  E  S C

309  153  546 1 6 1 1 1 5 5 3 1 1 1 3 1 5 5 3 1 5 5 1 1 5 5 1 1 1 5 3 .  .  0 .
310  154  546 2 4 2 1 1 5 5 5 1 1 1 1 1 3 4 3 1 5 5 3 1 5 4 1 1 1 5 3 .  .  0 .
311  154  546 2 5 1 1 1 5 5 4 1 1 1 2 1 2 5 3 1 5 5 4 1 5 3 1 1 1 5 3 .  .  0 .
312  154  546 2 6 2 1 1 5 5 4 1 1 1 3 1 3 4 4 1 4 4 3 1 5 5 2 1 1 4 3 .  .  0 .
313  155  548 1 4 3 1 1 5 5 5 1 5 1 3 3 4 4 4 1 5 4 1 1 5 5 1 1 1 5 3 .  .  0 .
314  155  548 1 4 2 1 2 5 5 5 1 5 1 4 3 4 4 1 2 4 5 2 1 5 4 2 1 1 5 3 .  .  0 .
315  156  548 2 4 2 1 1 5 5 5 1 3 1 2 2 4 4 4 1 5 4 1 1 5 5 1 1 1 5 3 .  .  0 .
316  156  548 2 4 1 1 1 5 5 5 1 2 1 2 2 4 3 1 1 5 5 1 1 5 4 1 1 1 5 3 .  .  0 .
 .    .    .  . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  .  . .

Number of cases read =       317    Number of cases listed =       317
```

Appendix XXVII

Command Files for Model A1P

```
title COVARIANCE MATRIX FOR MODEL A1 -- PROGRAM DATA
get file='PGMDATA'/KEEP=ESCAPTV,FRIENDS,
 DEPRESS,ISOLATN,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=ESCAPTV,FRIENDS,DEPRESS,ISOLATN,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.A1P'
finish
```

```
TITLE 'EIP MODEL A1 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.A1P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
LIZ'S MODEL A WITH ESCAPTV
DA NG=1 NI=5 NO=133 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'ESCAPTV' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'
SE
 'ESCAPTV' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,4) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(3,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .0435  TE(1,1)
VA .061   TE(2,2)
VA .041   TE(3,3)
VA .035   TE(4,4)
VA .8948  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXVIII

Command Files for Model A2P

```
title COVARIANCE MATRIX FOR MODEL A2 -- PROGRAM DATA
get file='PGMDATA'/KEEP=RELYGOD,FRIENDS,
 DEPRESS,ISOLATN,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=RELYGOD,FRIENDS,DEPRESS,ISOLATN,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.A2P'
finish
```

```
TITLE 'EIP MODEL A2 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.A2P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
LIZ'S MODEL A WITH RELYGOD
DA NG=1 NI=5 NO=132 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'RELYGOD' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'
SE
 'RELYGOD' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,4) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(3,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .1145  TE(1,1)
VA .061   TE(2,2)
VA .041   TE(3,3)
VA .035   TE(4,4)
VA .8948  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXIX

Command Files for Model A3P

```
title COVARIANCE MATRIX FOR MODEL A3 -- PROGRAM DATA
get file='PGMDATA'/KEEP=DRINK,FRIENDS,
 DEPRESS,ISOLATN,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=DRINK,FRIENDS,DEPRESS,ISOLATN,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.A3P'
finish
```

```
TITLE 'EIP MODEL A3 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.A3P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
LIZ'S MODEL A WITH DRINK
DA NG=1 NI=5 NO=134 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'DRINK' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'
SE
 'DRINK' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,4) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(3,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .0255  TE(1,1)
VA .061   TE(2,2)
VA .041   TE(3,3)
VA .035   TE(4,4)
VA .8948  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXX

Command Files for Model A1T

```
title COVARIANCE MATRIX FOR MODEL A1 -- TOTAL DATA
get file='TOLDATA'/KEEP=ESCAPTV,FRIENDS,
 DEPRESS,ISOLATN,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=ESCAPTV,FRIENDS,DEPRESS,ISOLATN,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.A1T'
finish
```

```
TITLE 'EIP MODEL A1 -- TOTAL DATA'
FILE HANDLE #8/NAME='COV.A1T'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
LIZ'S MODEL A WITH ESCAPTV
DA NG=1 NI=5 NO=306 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'ESCAPTV' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'
SE
 'ESCAPTV' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,4) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(3,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .0485  TE(1,1)
VA .0725  TE(2,2)
VA .0345  TE(3,3)
VA .0395  TE(4,4)
VA .6464  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXXI

Command Files for Model A2T/A4T

```
title COVARIANCE MATRIX FOR MODEL A2 -- TOTAL DATA
get file='TOLDATA'/KEEP=RELYGOD,FRIENDS,
 DEPRESS,ISOLATN,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=RELYGOD,FRIENDS,DEPRESS,ISOLATN,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.A2T'
finish
```

```
TITLE 'EIP MODEL A4 -- TOTAL DATA'
FILE HANDLE #8/NAME='COV.A2T'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
REVISION OF MODEL.A2T
DA NG=1 NI=5 NO=305 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'RELYGOD' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'
SE
 'RELYGOD' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(2,1) BE(3,1) BE(3,4) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(3,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .0975  TE(1,1)
VA .0725  TE(2,2)
VA .0345  TE(3,3)
VA .0395  TE(4,4)
VA .6464  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXXII

Command Files for Model A3T/A5T

```
title COVARIANCE MATRIX FOR MODEL A3 -- TOTAL DATA
get file='TOLDATA'/KEEP=DRINK,FRIENDS,
 DEPRESS,ISOLATN,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=DRINK,FRIENDS,DEPRESS,ISOLATN,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.A3T'
finish
```

```
TITLE 'EIP MODEL A5 -- TOTAL DATA'
FILE HANDLE #8/NAME='COV.A3T'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
REVISION OF MODEL.A3T
DA NG=1 NI=5 NO=305 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'DRINK' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'
SE
 'DRINK' 'FRIENDS' 'DEPRESS'
 'ISOLATN' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,2) BE(3,4) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(3,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .0275  TE(1,1)
VA .0725  TE(2,2)
VA .0345  TE(3,3)
VA .0395  TE(4,4)
VA .6464  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXXIII

Command Files for Model B1P

```
title COVARIANCE MATRIX FOR MODEL B1 -- PROGRAM DATA
get file='PGMDATA'/KEEP=COUNSEL,FINSEC,
 RESTRIC,CONFLCT,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=COUNSEL,FINSEC,RESTRIC,CONFLCT,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.B1P'
finish
```

```
TITLE 'EIP MODEL B1 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.B1P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
DEANNA'S MODEL
DA NG=1 NI=5 NO=131 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'COUNSEL' 'FINSEC' 'RESTRIC'
 'CONFLCT' 'EIPMOS'
SE
 'COUNSEL' 'FINSEC' 'RESTRIC'
 'CONFLCT' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(2,1) BE(3,1) BE(3,2) BE(4,2) BE(4,3)
FR GA(1,1) GA(3,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .056   TE(1,1)
VA .071   TE(2,2)
VA .0795  TE(3,3)
VA .0585  TE(4,4)
VA .8948  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXXIV

Command Files for Model B1T

```
title COVARIANCE MATRIX FOR MODEL B1 -- TOTAL DATA
get file='TOLDATA'/KEEP=COUNSEL,FINSEC,
 RESTRIC,CONFLCT,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=COUNSEL,FINSEC,RESTRIC,CONFLCT,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.B1T'
finish
```

```
TITLE 'EIP MODEL B1 -- TOTAL DATA'
FILE HANDLE #8/NAME='COV.B1T'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
DEANNA'S MODEL
DA NG=1 NI=5 NO=304 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'COUNSEL' 'FINSEC' 'RESTRIC'
 'CONFLCT' 'EIPMOS'
SE
 'COUNSEL' 'FINSEC' 'RESTRIC'
 'CONFLCT' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(2,1) BE(3,1) BE(3,2) BE(4,2) BE(4,3)
FR GA(1,1) GA(3,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .0415  TE(1,1)
VA .086   TE(2,2)
VA .076   TE(3,3)
VA .0685  TE(4,4)
VA .6464  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXXV

Command Files for Model C2P

```
title COVARIANCE MATRIX FOR MODEL C2 -- PROGRAM DATA
get file='PGMDATA'/KEEP=ACCOMP,UPSET,PHYHLTH,
 DEMAND,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=ACCOMP,UPSET,PHYHLTH,DEMAND,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.C2P'
finish
```

```
TITLE 'EIP MODEL C2 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.C2P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
JENNIFER'S MODEL C WITH ACCOMP/UPSET
DA NG=1 NI=5 NO=127 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'ACCOMP' 'UPSET' 'PHYHLTH'
 'DEMAND' 'EIPMOS'
SE
 'ACCOMP' 'UPSET' 'PHYHLTH'
 'DEMAND' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,2) BE(4,1) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(4,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .0415  TE(1,1)
VA .0415  TE(2,2)
VA .0415  TE(3,3)
VA .0675  TE(4,4)
VA .8948  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXXVI

Command Files for Model C3P

```
title COVARIANCE MATRIX FOR MODEL C3 -- PROGRAM DATA
get file='PGMDATA'/KEEP=INTERST,UPSET,PHYHLTH,
 DEMAND,EIPMOS
include 'taer:cov.mac'
set printbach=off
cov vars=INTERST,UPSET,PHYHLTH,DEMAND,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.C3P'
finish
```

```
TITLE 'EIP MODEL C3 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.C3P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
JENNIFER'S MODEL C WITH INTERST/UPSET
DA NG=1 NI=5 NO=127 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'INTERST' 'UPSET' 'PHYHLTH'
 'DEMAND' 'EIPMOS'
SE
 'INTERST' 'UPSET' 'PHYHLTH'
 'DEMAND' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,2) BE(4,1) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(4,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .034   TE(1,1)
VA .0415  TE(2,2)
VA .0415  TE(3,3)
VA .0675  TE(4,4)
VA .8948  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXXVII

Command Files for Model C4P

```
title COVARIANCE MATRIX FOR MODEL C4 -- PROGRAM DATA
get file='PGMDATA'/KEEP=INTERST,RESTLES,PHYHLTH,
 DEMAND,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=INTERST,RESTLES,PHYHLTH,DEMAND,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.C4P'
finish
```

```
TITLE 'EIP MODEL C4 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.C4P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
JENNIFER'S MODEL C WITH INTERST/RESTLES
DA NG=1 NI=5 NO=127 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'INTERST' 'RESTLES' 'PHYHLTH'
 'DEMAND' 'EIPMOS'
SE
 'INTERST' 'RESTLES' 'PHYHLTH'
 'DEMAND' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,2) BE(4,1) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(4,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .034   TE(1,1)
VA .076   TE(2,2)
VA .0415  TE(3,3)
VA .0675  TE(4,4)
VA .8948  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXXVIII

Command Files for Model C1P/C5P

```
title COVARIANCE MATRIX FOR MODEL C1 -- PROGRAM DATA
get file='PGMDATA'/KEEP=ACCOMP,RESTLES,PHYHLTH,
 DEMAND,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=ACCOMP,RESTLES,PHYHLTH,DEMAND,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.C1P'
finish
```

```
TITLE 'EIP MODEL C5 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.C1P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
REVISION OF MODEL.C1P
DA NG=1 NI=5 NO=127 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'ACCOMP' 'RESTLES' 'PHYHLTH'
 'DEMAND' 'EIPMOS'
SE
 'ACCOMP' 'RESTLES' 'PHYHLTH'
 'DEMAND' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,2) BE(4,1) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(3,1) GA(4,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .0415  TE(1,1)
VA .076   TE(2,2)
VA .0415  TE(3,3)
VA .0675  TE(4,4)
VA .8948  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XXXIX

Command Files for Model C1T

```
title COVARIANCE MATRIX FOR MODEL C1 -- TOTAL DATA
get file='TOLDATA'/KEEP=ACCOMP,RESTLES,PHYHLTH,
 DEMAND,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=ACCOMP,RESTLES,PHYHLTH,DEMAND,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.C1T'
finish
```

```
TITLE 'EIP MODEL CI -- TOTAL DATA'
FILE HANDLE #8/NAME='COV.C1T'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
JENNIFER'S MODEL C WITH ACCOMP/RESTLES
DA NG=1 NI=5 NO=293 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'ACCOMP' 'RESTLES' 'PHYHLTH'
 'DEMAND' 'EIPMOS'
SE
 'ACCOMP' 'RESTLES' 'PHYHLTH'
 'DEMAND' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,2) BE(4,1) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(4,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .052   TE(1,1)
VA .0695  TE(2,2)
VA .048   TE(3,3)
VA .054   TE(4,4)
VA .6464  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XL

Command Files for Model C4T

```
title COVARIANCE MATRIX FOR MODEL C4 -- TOTAL DATA
get file='TOLDATA'/KEEP=INTERST,RESTLES,PHYHLTH,
 DEMAND,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=INTERST,RESTLES,PHYHLTH,DEMAND,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.C4T'
finish
```

```
TITLE 'EIP MODEL C4 -- TOTAL DATA'
FILE HANDLE #8/NAME='COV.C4T'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
JENNIFER'S MODEL C WITH INTERST/RESTLES
DA NG=1 NI=5 NO=293 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'INTERST' 'RESTLES' 'PHYHLTH'
 'DEMAND' 'EIPMOS'
SE
 'INTERST' 'RESTLES' 'PHYHLTH'
 'DEMAND' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(3,1) BE(3,2) BE(4,1) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(4,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .0455  TE(1,1)
VA .0695  TE(2,2)
VA .048   TE(3,3)
VA .054   TE(4,4)
VA .6464  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XLI

Command Files for Model C3T/C6T

```
title COVARIANCE MATRIX FOR MODEL C3 -- TOTAL DATA
get file='TOLDATA'/KEEP=INTERST,UPSET,PHYHLTH,
 DEMAND,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=INTERST,UPSET,PHYHLTH,DEMAND,EIPMOS
   /nvars=5
   /missing=pairwise
   /file='COV.C3T'
finish
```

```
TITLE 'EIP MODEL C6 -- TOTAL DATA'
FILE HANDLE #8/NAME='COV.C3T'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
REVISION OF MODEL.C3T
DA NG=1 NI=5 NO=293 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'INTERST' 'UPSET' 'PHYHLTH'
 'DEMAND' 'EIPMOS'
SE
 'INTERST' 'UPSET' 'PHYHLTH'
 'DEMAND' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(2,3) BE(3,1) BE(3,2) BE(4,1) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(4,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .0455  TE(1,1)
VA .0425  TE(2,2)
VA .048   TE(3,3)
VA .054   TE(4,4)
VA .6464  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XLII

Command Files for Model C2T/C7T

```
title COVARIANCE MATRIX FOR MODEL C2 -- TOTAL DATA
get file='TOLDATA'/KEEP=ACCOMP,UPSET,PHYHLTH,
 DEMAND,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=ACCOMP,UPSET,PHYHLTH,DEMAND,EIPMOS
  /nvars=5
  /missing=pairwise
  /file='COV.C2T'
finish
```

```
TITLE 'EIP MODEL C7 -- TOTAL DATA'
FILE HANDLE #8/NAME='COV.C2T'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
REVISION OF MODEL.C2T
DA NG=1 NI=5 NO=293 MA=CM
CM UN=8 FU FO
(5F10.4)
LA
 'ACCOMP' 'UPSET' 'PHYHLTH'
 'DEMAND' 'EIPMOS'
SE
 'ACCOMP' 'UPSET' 'PHYHLTH'
 'DEMAND' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(2,3) BE(3,1) BE(3,2) BE(4,1) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(4,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA .052   TE(1,1)
VA .0425  TE(2,2)
VA .048   TE(3,3)
VA .054   TE(4,4)
VA .6464  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XLIII

Command Files for Model D1P

```
title COVARIANCE MATRIX FOR MODEL D1 -- PROGRAM DATA
get file='PGMDATA'/KEEP=HAPPYOC,ATTACH,COMPET,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=HAPPYOC,ATTACH,COMPET,EIPMOS
  /nvars=4
  /missing=pairwise
  /file='COV.D1P'
finish
```

```
TITLE 'EIP MODEL D1 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.D1P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
JENNIFER'S MODEL D1
DA NG=1 NI=4 NO=130 MA=CM
CM UN=8 FU FO
(4F10.4)
LA
 'HAPPYOC' 'ATTACH' 'COMPET' 'EIPMOS'
SE
 'HAPPYOC' 'ATTACH' 'COMPET' 'EIPMOS'/
MO NY=3 NX=1 NE=3 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(2,1) BE(3,1) BE(2,3)
FR GA(1,1) GA(3,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LX(1,1)
VA .0235  TE(1,1)
VA .063   TE(2,2)
VA .016   TE(3,3)
VA .8948  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XLIV

Command Files for Model E1P/E2P

```
title COVARIANCE MATRIX FOR MODEL E1 -- PROGRAM DATA
get file='PGMDATA'/KEEP=MASTERY,ACCEPT,DEPRESS,ENTRYAGE
include 'taer:cov.mac'
set printback=off
cov vars=MASTERY,ACCEPT,DEPRESS,ENTRYAGE
  /nvars=4
  /missing=pairwise
  /file='COV.E1P'
finish
```

```
TITLE 'EIP MODEL E2 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.E1P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
REVISION OF DEANNA'S MODEL E1
DA NG=1 NI=4 NO=135 MA=CM
CM UN=8 FU FO
(4F10.4)
LA
 'MASTERY' 'ACCEPT' 'DEPRESS' 'ENTRYAGE'
SE
 'MASTERY' 'ACCEPT' 'DEPRESS' 'ENTRYAGE'
MO NY=3 NX=1 NE=3 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(2,1) BE(3,1) BE(3,2)
FR GA(1,1) GA(3,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LX(1,1)
VA .047   TE(1,1)
VA .075   TE(2,2)
VA .041   TE(3,3)
VA .5831  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XLV

Command Files for Model F1P/F3P

```
title COVARIANCE MATRIX FOR MODEL F1 -- TOTAL DATA
get file='TOLDATA'/KEEP=PROBSOL,REFRAME,MUTUAL,
 STRESS,DEMAND,APPREC,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=PROBSOL,REFRAME,MUTUAL,STRESS,DEMAND,
 APPREC,EIPMOS
  /nvars=7
  /missing=pairwise
  /file='COV.F1T'
finish
```

```
TITLE 'EIP MODEL F3 -- TOTAL DATA'
FILE HANDLE #8/NAME='COV.F1T'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
SECOND REVISION OF LIZ'S MODEL F1
DA NG=1 NI=7 NO=300 MA=CM
CM UN=8 FU FO
(7F10.4)
LA
 'PROBSOL' 'REFRAME' 'MUTUAL' 'STRESS'
 'DEMAND' 'APPREC' 'EIPMOS'
SE
 'PROBSOL' 'REFRAME' 'MUTUAL' 'STRESS'
 'DEMAND' 'APPREC' 'EIPMOS'/
MO NY=6 NX=1 NE=6 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(1,2) BE(1,3) BE(4,1) BE(4,2) BE(4,3) BE(5,4)
FR BE(6,4) BE(6,5)
FR GA(1,1) GA(2,1) GA(3,1) GA(4,1) GA(5,1) GA(6,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4) PS(5,5) PS(6,6)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LY(5,5)
VA 1.0 LY(6,6) LX(1,1)
VA .04    TE(1,1)
VA .043   TE(2,2)
VA .054   TE(3,3)
VA .0395  TE(4,4)
VA .054   TE(5,5)
VA .025   TE(6,6)
VA .6464  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XLVI

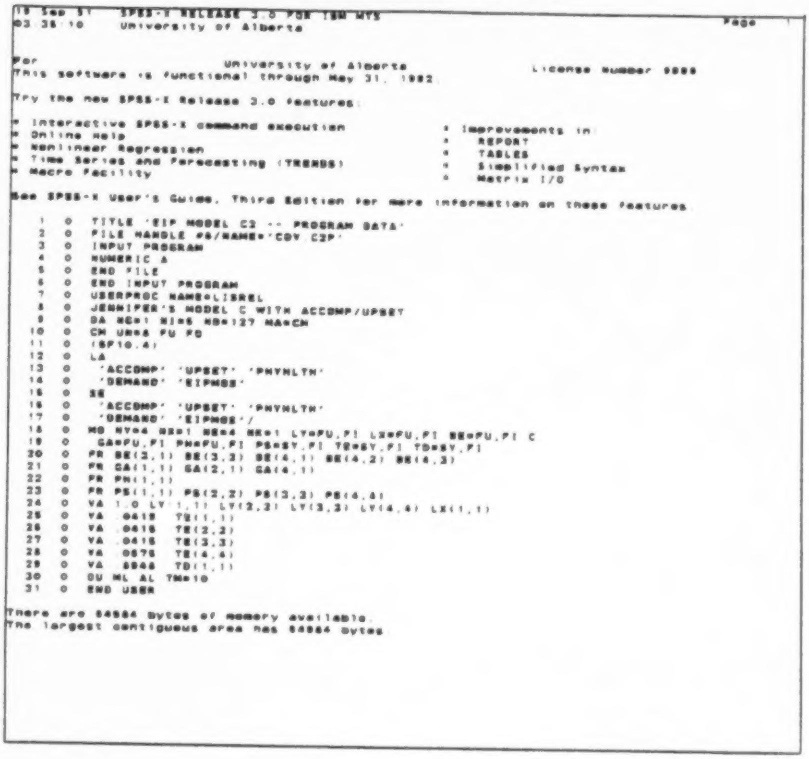
Command Files for Model F1T/F3T

```
title COVARIANCE MATRIX FOR MODEL F1 -- PROGRAM DATA
get file='PGMDATA'/KEEP=PROBSOL,REFRAME,MUTUAL,STRESS,
 DEMAND,APPREC,EIPMOS
include 'taer:cov.mac'
set printback=off
cov vars=PROBSOL,REFRAME,MUTUAL,STRESS,DEMAND,
 APPREC,EIPMOS
  /nvars=7
  /missing=pairwise
  /file='COV.F1P'
finish
```

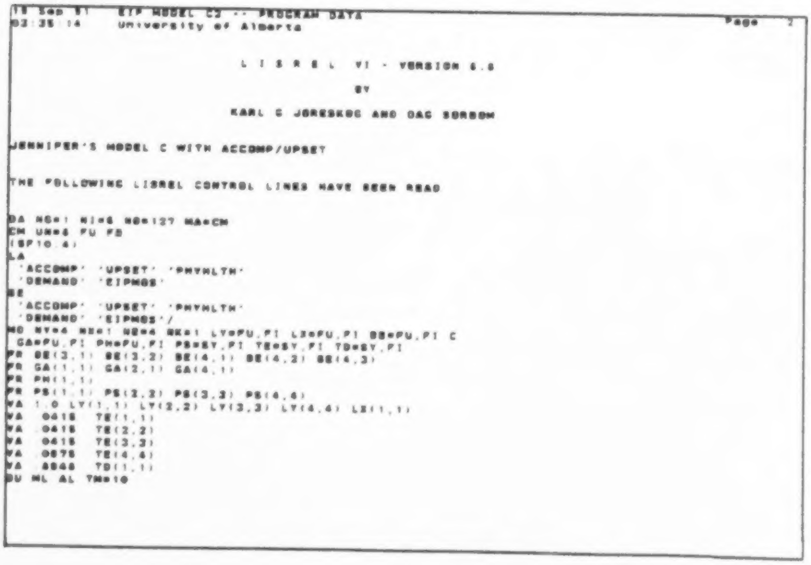
```
TITLE 'EIP MODEL F3 -- PROGRAM DATA'
FILE HANDLE #8/NAME='COV.F1P'
INPUT PROGRAM
NUMERIC A
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL
SECOND REVISION OF LIZ'S MODEL F1
DA NG=1 NI=7 NO=130 MA=CM
CM UN=8 FU FO
(7F10.4)
LA
 'PROBSOL' 'REFRAME' 'MUTUAL' 'STRESS'
 'DEMAND' 'APPREC' 'EIPMOS'
SE
 'PROBSOL' 'REFRAME' 'MUTUAL' 'STRESS'
 'DEMAND' 'APPREC' 'EIPMOS'/
MO NY=6 NX=1 NE=6 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(1,2) BE(1,3) BE(4,1) BE(4,2) BE(4,3) BE(4,5)
FR BE(5,4) BE(6,4) BE(6,5)
FR GA(1,1) GA(2,1) GA(3,1) GA(4,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4) PS(5,5) PS(6,6)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LY(5,5)
VA 1.0 LY(6,6) LX(1,1)
VA .042   TE(1,1)
VA .0405  TE(2,2)
VA .053   TE(3,3)
VA .038   TE(4,4)
VA .0675  TE(5,5)
VA .0205  TE(6,6)
VA .8948  TD(1,1)
OU ML AL TM=10
END USER
FINISH
```

Appendix XLVII

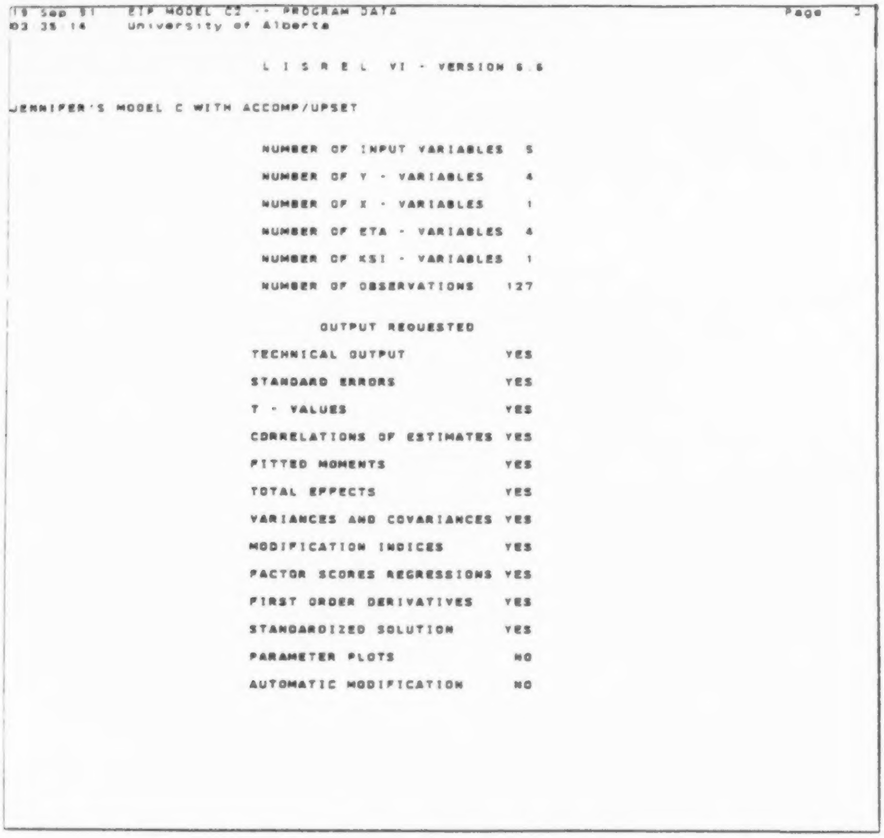
LISREL Output for Best Model (C2P)



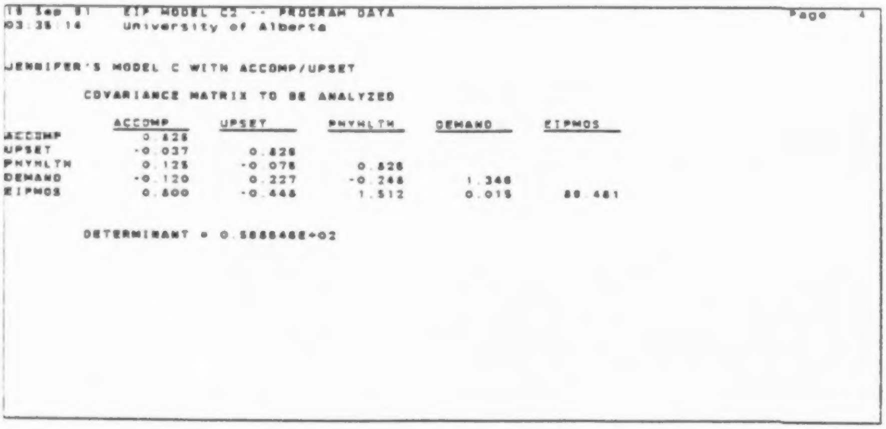
```
19 Sep 91    SPSS-X RELEASE 3.0 FOR IBM MTS                                              Page    1
03:35:10     University of Alberta

For                         University of Alberta                        License Number 9999
This software is functional through May 31, 1992.

Try the new SPSS-X Release 3.0 features:

* Interactive SPSS-X command execution                     * Improvements in:
* Online Help                                              *    REPORT
* Nonlinear Regression                                     *    TABLES
* Time Series and Forecasting (TRENDS)                     *    Simplified Syntax
* Macro Facility                                           *    Matrix I/O

See SPSS-X User's Guide, Third Edition for more information on these features.

   1  0  TITLE 'EIP MODEL C2 -- PROGRAM DATA'
   2  0  FILE HANDLE F6/NAME='COV C2P'
   3  0  INPUT PROGRAM
   4  0  NUMERIC A
   5  0  END FILE
   6  0  END INPUT PROGRAM
   7  0  USERPROC NAME=LISREL
   8  0  JENNIFER'S MODEL C WITH ACCOMP/UPSET
   9  0  DA NG=1 NI=5 NO=127 MA=CM
  10  0  CM UN=8 FU FO
  11  0  (8F10.4)
  12  0  LA
  13  0   'ACCOMP' 'UPSET' 'PHYHLTH'
  14  0   'DEMAND' 'EIPMOS'
  15  0  SE
  16  0   'ACCOMP' 'UPSET' 'PHYHLTH'
  17  0   'DEMAND' 'EIPMOS'/
  18  0  MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
  19  0   GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
  20  0  FR BE(2,1) BE(3,2) BE(4,1) BE(4,2) BE(4,3)
  21  0  FR GA(1,1) GA(2,1) GA(4,1)
  22  0  FR PH(1,1)
  23  0  FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
  24  0  VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
  25  0  VA .0415  TE(1,1)
  26  0  VA .0415  TE(2,2)
  27  0  VA .0415  TE(3,3)
  28  0  VA .0575  TE(4,4)
  29  0  VA .8848  TD(1,1)
  30  0  OU ML AL TM=10
  31  0  END USER

There are 54984 bytes of memory available.
The largest contiguous area has 54984 bytes.
```



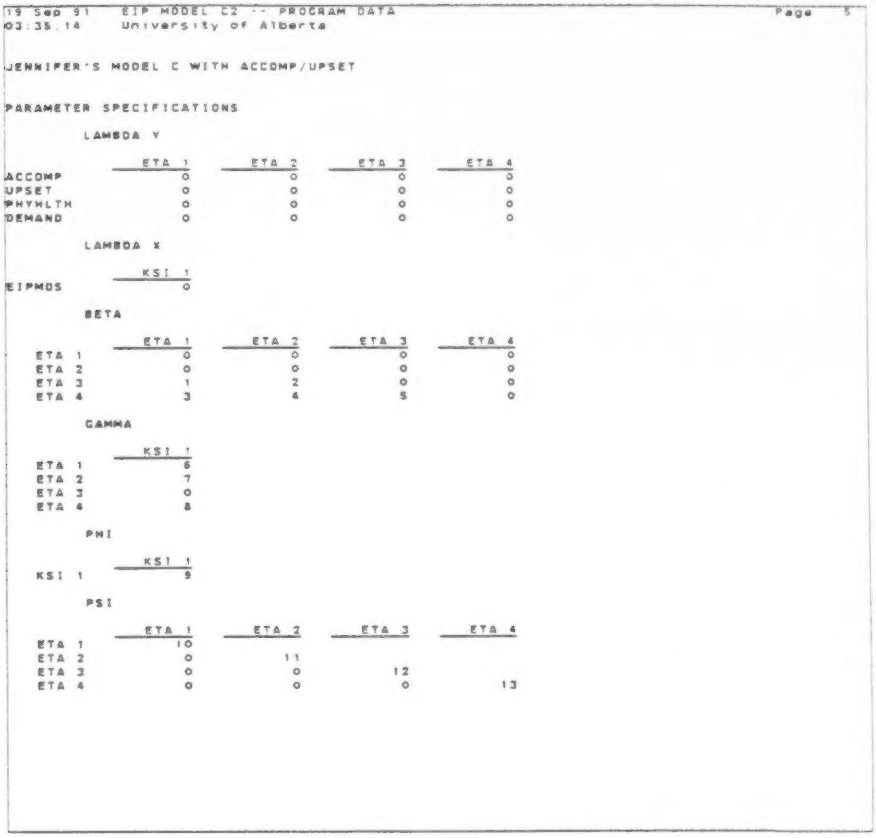
```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                                Page    2
03:35:14     University of Alberta

                              L I S R E L  VI - VERSION 6.6

                                            BY

                              KARL G JORESKOG AND DAG SORBOM

JENNIFER'S MODEL C WITH ACCOMP/UPSET

THE FOLLOWING LISREL CONTROL LINES HAVE BEEN READ

DA NG=1 NI=5 NO=127 MA=CM
CM UN=8 FU FO
(8F10.4)
LA
 'ACCOMP' 'UPSET' 'PHYHLTH'
 'DEMAND' 'EIPMOS'
SE
 'ACCOMP' 'UPSET' 'PHYHLTH'
 'DEMAND' 'EIPMOS'/
MO NY=4 NX=1 NE=4 NK=1 LY=FU,FI LX=FU,FI BE=FU,FI C
 GA=FU,FI PH=FU,FI PS=SY,FI TE=SY,FI TD=SY,FI
FR BE(2,1) BE(3,2) BE(4,1) BE(4,2) BE(4,3)
FR GA(1,1) GA(2,1) GA(4,1)
FR PH(1,1)
FR PS(1,1) PS(2,2) PS(3,3) PS(4,4)
VA 1.0 LY(1,1) LY(2,2) LY(3,3) LY(4,4) LX(1,1)
VA  .0415  TE(1,1)
VA  .0415  TE(2,2)
VA  .0415  TE(3,3)
VA  .0575  TE(4,4)
VA  .8848  TD(1,1)
OU ML AL TM=10
```



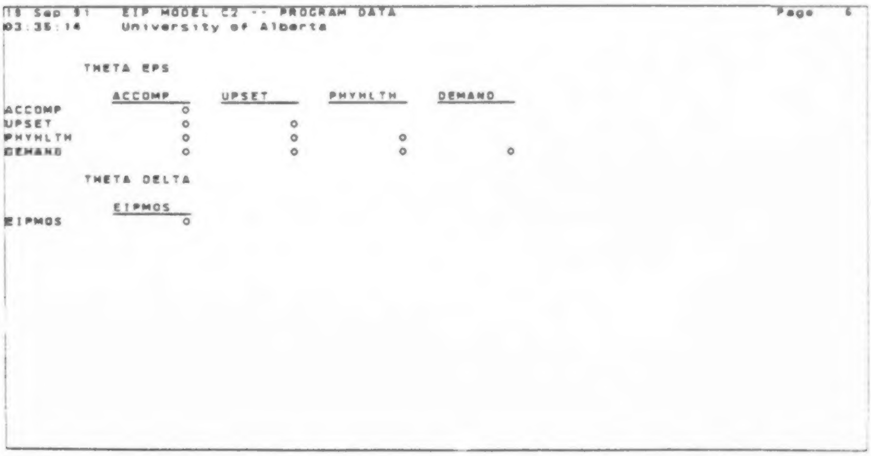
```
19 Sep 91     EIP MODEL C2 -- PROGRAM DATA                                Page   3
03:35:14      University of Alberta

                              L I S R E L  VI - VERSION 6.6

JENNIFER'S MODEL C WITH ACCOMP/UPSET

                               NUMBER OF INPUT VARIABLES  5

                               NUMBER OF Y - VARIABLES    4

                               NUMBER OF X - VARIABLES    1

                               NUMBER OF ETA - VARIABLES  4

                               NUMBER OF KSI - VARIABLES  1

                               NUMBER OF OBSERVATIONS   127

                                     OUTPUT REQUESTED

                              TECHNICAL OUTPUT           YES

                              STANDARD ERRORS            YES

                              T - VALUES                 YES

                              CORRELATIONS OF ESTIMATES  YES

                              FITTED MOMENTS             YES

                              TOTAL EFFECTS              YES

                              VARIANCES AND COVARIANCES  YES

                              MODIFICATION INDICES       YES

                              FACTOR SCORES REGRESSIONS  YES

                              FIRST ORDER DERIVATIVES    YES

                              STANDARDIZED SOLUTION      YES

                              PARAMETER PLOTS             NO

                              AUTOMATIC MODIFICATION      NO
```



```
19 Sep 91     EIP MODEL C2 -- PROGRAM DATA                                Page   4
03:35:14      University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

        COVARIANCE MATRIX TO BE ANALYZED

              ACCOMP      UPSET       PHYHLTH     DEMAND      EIPMOS
              --------    --------    --------    --------    --------
ACCOMP          0.826
UPSET          -0.037       0.826
PHYHLTH         0.125      -0.076       0.826
DEMAND         -0.120       0.227      -0.246       1.346
EIPMOS          0.800      -0.446       1.512       0.015      88.461

        DETERMINANT = 0.588846E+02
```



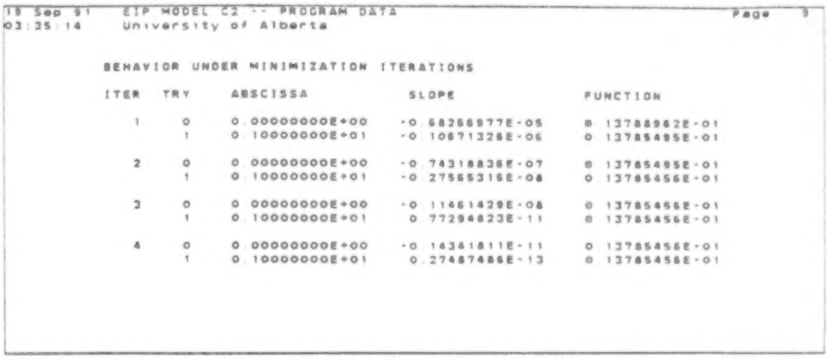
```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                     Page   5
03:35:14     University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

PARAMETER SPECIFICATIONS

        LAMBDA Y

              ETA 1       ETA 2       ETA 3       ETA 4
ACCOMP            0           0           0           0
UPSET             0           0           0           0
PHYHLTH           0           0           0           0
DEMAND            0           0           0           0

        LAMBDA X

              KSI 1
EIPMOS            0

        BETA

              ETA 1       ETA 2       ETA 3       ETA 4
   ETA 1          0           0           0           0
   ETA 2          0           0           0           0
   ETA 3          1           2           0           0
   ETA 4          3           4           5           0

        GAMMA

              KSI 1
   ETA 1          6
   ETA 2          7
   ETA 3          0
   ETA 4          8

        PHI

              KSI 1
   KSI 1          9

        PSI

              ETA 1       ETA 2       ETA 3       ETA 4
   ETA 1         10
   ETA 2          0          11
   ETA 3          0           0          12
   ETA 4          0           0           0          13
```



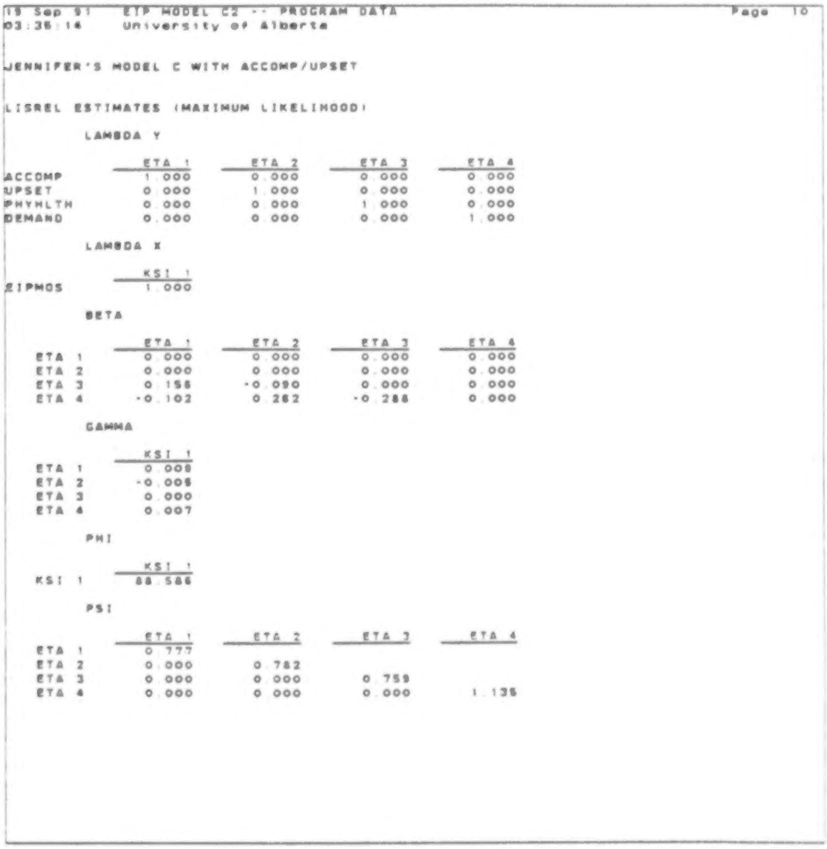
```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                     Page   6
03:35:14     University of Alberta

        THETA EPS

              ACCOMP      UPSET       PHYHLTH     DEMAND
ACCOMP            0
UPSET             0           0
PHYHLTH           0           0           0
DEMAND            0           0           0           0

        THETA DELTA

              EIPMOS
EIPMOS            0
```

```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                        Page  7
03:35:14     University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

INITIAL ESTIMATES (TSLS)

         LAMBDA Y

                   ETA 1        ETA 2        ETA 3        ETA 4
                 --------     --------     --------     --------
ACCOMP              1.000        0.000        0.000        0.000
UPSET               0.000        1.000        0.000        0.000
PHYHLTH             0.000        0.000        1.000        0.000
DEMAND              0.000        0.000        0.000        1.000

         LAMBDA X

                   KSI 1
                 --------
EIPMOS              1.000

         BETA

                   ETA 1        ETA 2        ETA 3        ETA 4
                 --------     --------     --------     --------
   ETA 1            0.000        0.000        0.000        0.000
   ETA 2            0.000        0.000        0.000        0.000
   ETA 3            0.155       -0.088        0.000        0.000
   ETA 4           -0.102        0.282       -0.288        0.000

         GAMMA

                   KSI 1
                 --------
   ETA 1            0.009
   ETA 2           -0.005
   ETA 3            0.000
   ETA 4            0.007

         PHI

                   KSI 1
                 --------
   KSI 1           88.546

         PSI

                   ETA 1        ETA 2        ETA 3        ETA 4
                 --------     --------     --------     --------
   ETA 1            0.777
   ETA 2            0.000        0.782
   ETA 3            0.000        0.000        0.759
   ETA 4            0.000        0.000        0.000        1.128
```

```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                        Page  8
03:35:14     University of Alberta

         THETA EPS

                ACCOMP       UPSET        PHYHLTH      DEMAND
               --------     --------     --------     --------
ACCOMP            0.042
UPSET             0.000        0.042
PHYHLTH           0.000        0.000        0.042
DEMAND            0.000        0.000        0.000        0.067

         THETA DELTA

                EIPMOS
               --------
EIPMOS            0.495

         SQUARED MULTIPLE CORRELATIONS FOR Y - VARIABLES

                ACCOMP       UPSET        PHYHLTH      DEMAND
               --------     --------     --------     --------
                  0.950        0.950        0.950        0.950

         TOTAL COEFFICIENT OF DETERMINATION FOR Y - VARIABLES IS  1.000

         SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

                EIPMOS
               --------
                  0.950

         TOTAL COEFFICIENT OF DETERMINATION FOR X - VARIABLES IS  0.950

         SQUARED MULTIPLE CORRELATIONS FOR STRUCTURAL EQUATIONS

                 ETA 1        ETA 2        ETA 3        ETA 4
               --------     --------     --------     --------
                  0.008        0.003        0.032        0.114

         TOTAL COEFFICIENT OF DETERMINATION FOR STRUCTURAL EQUATIONS  IS  0.016
```



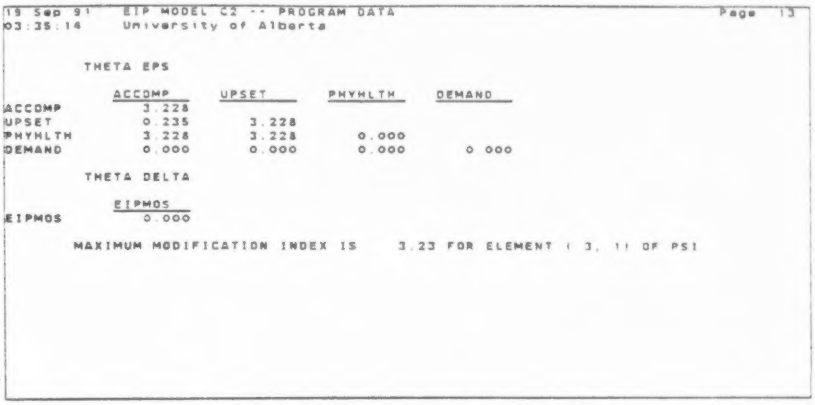
```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                        Page   9
03:35:14     University of Alberta

          BEHAVIOR UNDER MINIMIZATION ITERATIONS

          ITER  TRY    ABSCISSA            SLOPE                 FUNCTION

             1    0    0.00000000E+00     -0.68266977E-05       0.13788962E-01
                  1    0.10000000E+01     -0.10671326E-06       0.13785495E-01

             2    0    0.00000000E+00     -0.74318836E-07       0.13785495E-01
                  1    0.10000000E+01     -0.27565316E-08       0.13785456E-01

             3    0    0.00000000E+00     -0.11461429E-08       0.13785456E-01
                  1    0.10000000E+01      0.77294823E-11       0.13785456E-01

             4    0    0.00000000E+00     -0.14341811E-11       0.13785456E-01
                  1    0.10000000E+01      0.27487486E-13       0.13785456E-01
```



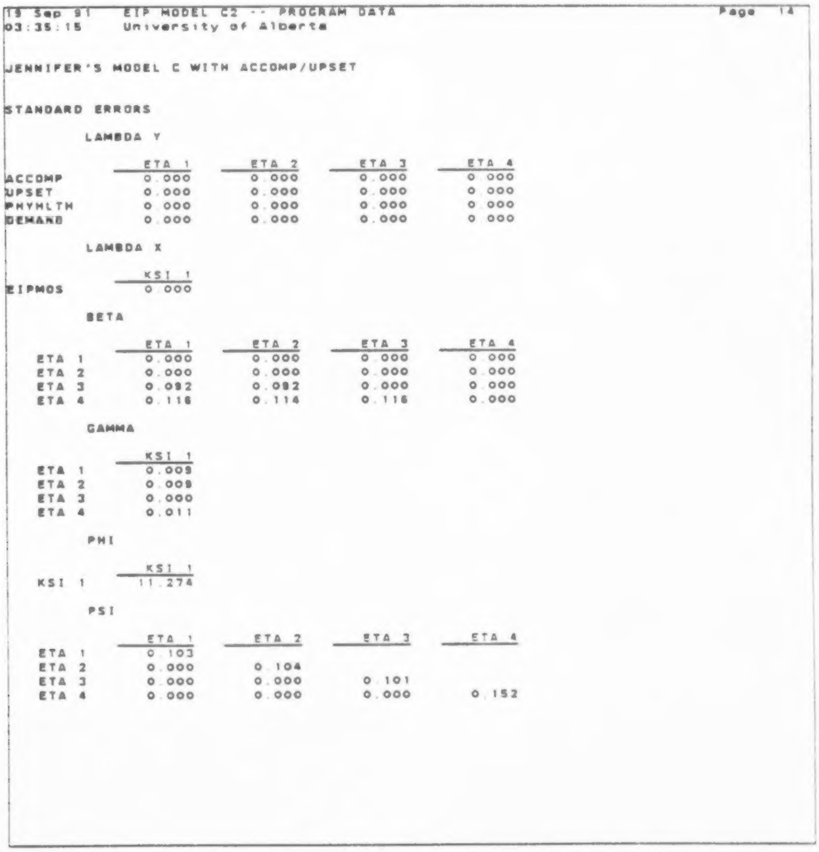
```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                        Page  10
03:35:14     University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

LISREL ESTIMATES (MAXIMUM LIKELIHOOD)

        LAMBDA Y

                  ETA 1      ETA 2      ETA 3      ETA 4
                 --------   --------   --------   --------
ACCOMP             1.000      0.000      0.000      0.000
UPSET              0.000      1.000      0.000      0.000
PHYHLTH            0.000      0.000      1.000      0.000
DEMAND             0.000      0.000      0.000      1.000

        LAMBDA X

                  KSI 1
                 --------
EIPMOS             1.000

        BETA

                  ETA 1      ETA 2      ETA 3      ETA 4
                 --------   --------   --------   --------
    ETA 1          0.000      0.000      0.000      0.000
    ETA 2          0.000      0.000      0.000      0.000
    ETA 3          0.156     -0.090      0.000      0.000
    ETA 4         -0.102      0.262     -0.288      0.000

        GAMMA

                  KSI 1
                 --------
    ETA 1          0.008
    ETA 2         -0.005
    ETA 3          0.000
    ETA 4          0.007

        PHI

                  KSI 1
                 --------
    KSI 1         88.586

        PSI

                  ETA 1      ETA 2      ETA 3      ETA 4
                 --------   --------   --------   --------
    ETA 1          0.777
    ETA 2          0.000      0.782
    ETA 3          0.000      0.000      0.759
    ETA 4          0.000      0.000      0.000      1.136
```

```
18 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                       Page  11
03:35:14     University of Alberta

        THETA EPS

             ACCOMP       UPSET        PHYHLTH      DEMAND
ACCOMP         0.042
UPSET          0.000        0.042
PHYHLTH        0.000        0.000        0.042
DEMAND         0.000        0.000        0.000        0.087

        THETA DELTA

             EIPMOS
EIPMOS         0.495

        SQUARED MULTIPLE CORRELATIONS FOR Y - VARIABLES

             ACCOMP       UPSET        PHYHLTH      DEMAND
               0.350        0.350        0.350        0.350

        TOTAL COEFFICIENT OF DETERMINATION FOR Y - VARIABLES IS  1.000

        SQUARED MULTIPLE CORRELATIONS FOR X - VARIABLES

             EIPMOS
               0.350

        TOTAL COEFFICIENT OF DETERMINATION FOR X - VARIABLES IS  0.350

        SQUARED MULTIPLE CORRELATIONS FOR STRUCTURAL EQUATIONS

               ETA 1        ETA 2        ETA 3        ETA 4
               0.008        0.003        0.033        0.114

        TOTAL COEFFICIENT OF DETERMINATION FOR STRUCTURAL EQUATIONS  IS  0.016


                MEASURES OF GOODNESS OF FIT FOR THE WHOLE MODEL :

    CHI-SQUARE WITH   2 DEGREES OF FREEDOM IS       3.47 (PROB. LEVEL = 0.176)

                      GOODNESS OF FIT INDEX IS 0.989

                 ADJUSTED GOODNESS OF FIT INDEX IS 0.944

                  ROOT MEAN SQUARE RESIDUAL IS      0.380
```

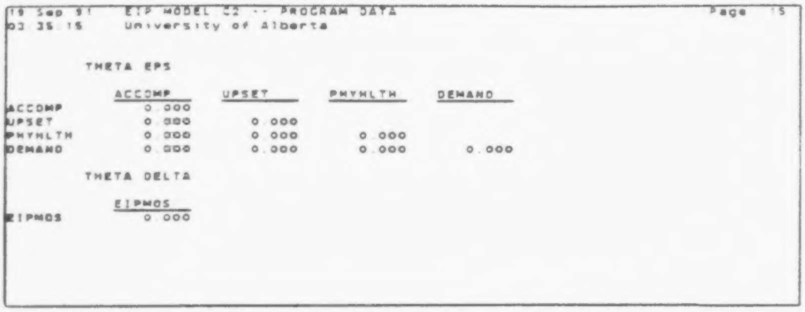
```
18 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                       Page  12
03:38:14     University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

MODIFICATION INDICES

        LAMBDA Y

               ETA 1        ETA 2        ETA 3        ETA 4
ACCOMP         0.000        0.205        1.023        0.125
UPSET          0.205        0.000        0.028        0.120
PHYHLTH        0.000        0.000        0.000        3.228
DEMAND         0.000        0.000        0.000        0.000

        LAMBDA X

               KSI 1
EIPMOS         0.000

        BETA

               ETA 1        ETA 2        ETA 3        ETA 4
   ETA 1       0.000        0.205        1.023        0.076
   ETA 2       0.205        0.000        0.028        0.087
   ETA 3       0.000        0.000        0.000        3.228
   ETA 4       0.000        0.000        0.000        0.000

        GAMMA

               KSI 1
   ETA 1       0.000
   ETA 2       0.000
   ETA 3       3.228
   ETA 4       0.000

        PHI

               KSI 1
   KSI 1       0.000

        PSI

               ETA 1        ETA 2        ETA 3        ETA 4
   ETA 1       0.000
   ETA 2       0.205        0.000
   ETA 3       3.228        3.228        0.000
   ETA 4       0.000        0.000        0.000        0.000
```



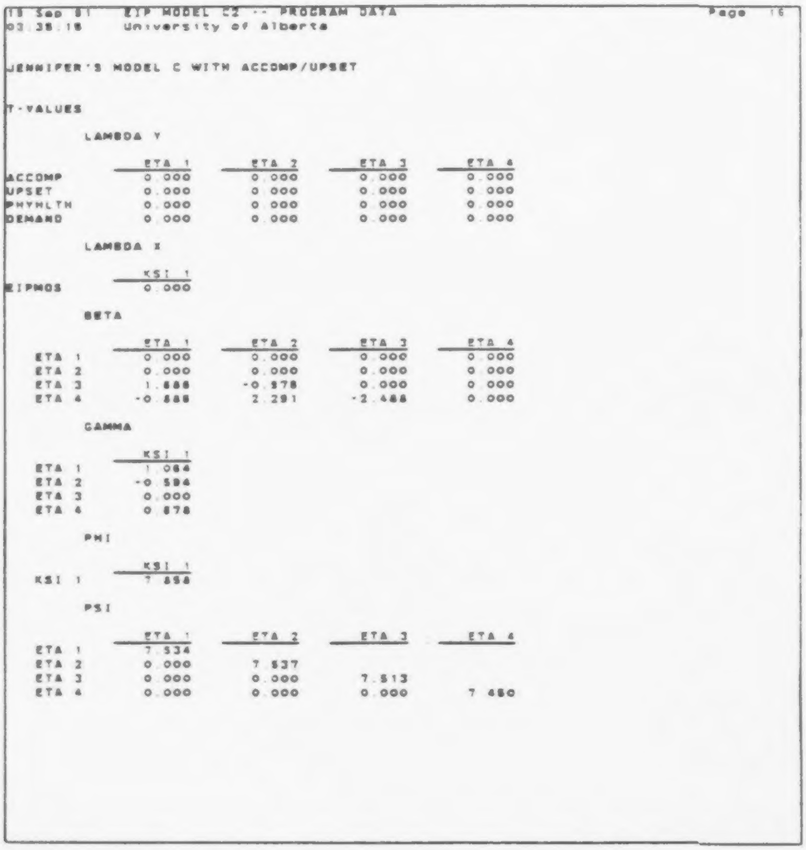
```
19 Sep 91     EIP MODEL C2 -- PROGRAM DATA                                        Page  13
03:35:14      University of Alberta

         THETA EPS

            ACCOMP        UPSET        PHYHLTH      DEMAND
ACCOMP       3.228
UPSET        0.235        3.228
PHYHLTH      3.228        3.228        0.000
DEMAND       0.000        0.000        0.000        0.000

         THETA DELTA

            EIPMOS
EIPMOS       0.000

        MAXIMUM MODIFICATION INDEX IS     3.23 FOR ELEMENT ( 3, 1) OF PSI
```



```
19 Sep 91     EIP MODEL C2 -- PROGRAM DATA                                        Page  14
03:35:15      University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

STANDARD ERRORS

         LAMBDA Y

                 ETA 1        ETA 2        ETA 3        ETA 4
ACCOMP           0.000        0.000        0.000        0.000
UPSET            0.000        0.000        0.000        0.000
PHYHLTH          0.000        0.000        0.000        0.000
DEMAND           0.000        0.000        0.000        0.000

         LAMBDA X

                 KSI 1
EIPMOS           0.000

         BETA

                 ETA 1        ETA 2        ETA 3        ETA 4
    ETA 1        0.000        0.000        0.000        0.000
    ETA 2        0.000        0.000        0.000        0.000
    ETA 3        0.082        0.082        0.000        0.000
    ETA 4        0.116        0.114        0.116        0.000

         GAMMA

                 KSI 1
    ETA 1        0.009
    ETA 2        0.008
    ETA 3        0.000
    ETA 4        0.011

         PHI

                 KSI 1
    KSI 1       11.274

         PSI

                 ETA 1        ETA 2        ETA 3        ETA 4
    ETA 1        0.103
    ETA 2        0.000        0.104
    ETA 3        0.000        0.000        0.101
    ETA 4        0.000        0.000        0.000        0.152
```



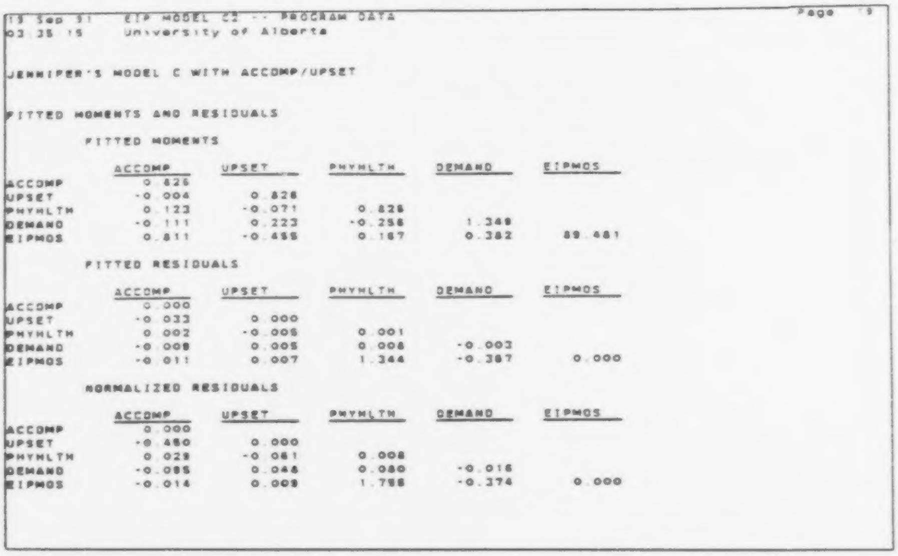
```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                              Page  15
03:35:15     University of Alberta


        THETA EPS

              ACCOMP       UPSET        PHYHLTH      DEMAND
ACCOMP         0.000
UPSET          0.000        0.000
PHYHLTH        0.000        0.000        0.000
DEMAND         0.000        0.000        0.000        0.000

        THETA DELTA

              EIPMOS
EIPMOS         0.000
```



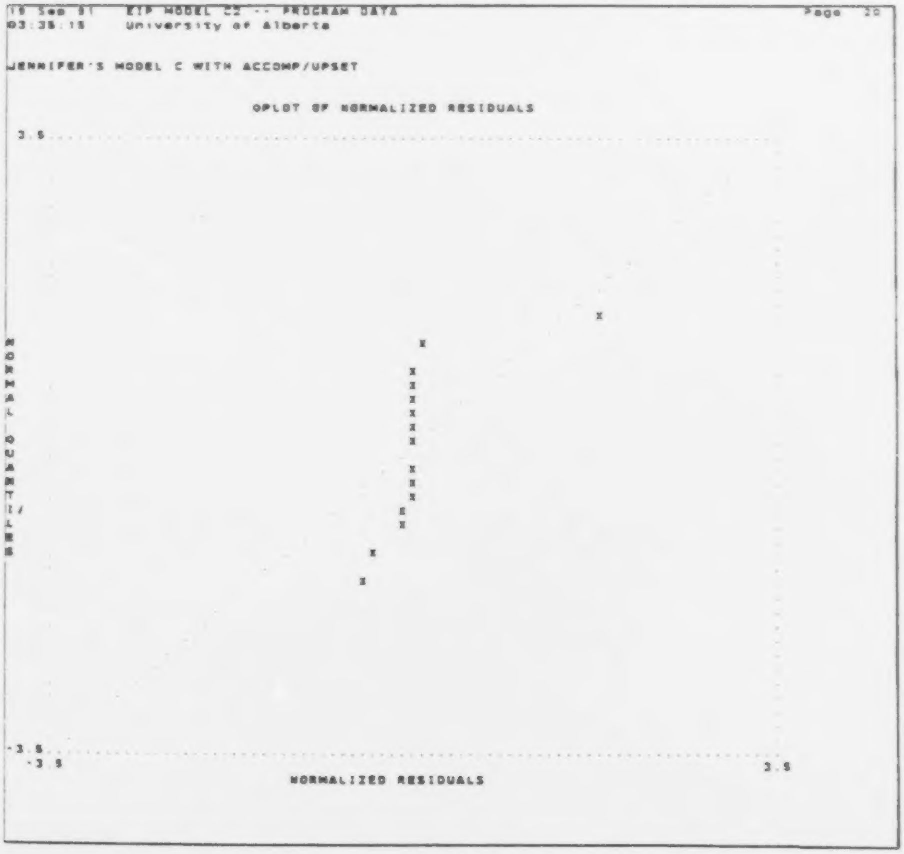
```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                              Page  16
03:35:15     University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

T-VALUES

        LAMBDA Y

               ETA 1        ETA 2        ETA 3        ETA 4
ACCOMP         0.000        0.000        0.000        0.000
UPSET          0.000        0.000        0.000        0.000
PHYHLTH        0.000        0.000        0.000        0.000
DEMAND         0.000        0.000        0.000        0.000

        LAMBDA X

               KSI 1
EIPMOS         0.000

        BETA

               ETA 1        ETA 2        ETA 3        ETA 4
   ETA 1       0.000        0.000        0.000        0.000
   ETA 2       0.000        0.000        0.000        0.000
   ETA 3       1.888       -0.378        0.000        0.000
   ETA 4      -0.888        2.291       -2.488        0.000

        GAMMA

               KSI 1
   ETA 1       1.064
   ETA 2      -0.594
   ETA 3       0.000
   ETA 4       0.878

        PHI

               KSI 1
   KSI 1       7.858

        PSI

               ETA 1        ETA 2        ETA 3        ETA 4
   ETA 1       7.534
   ETA 2       0.000        7.537
   ETA 3       0.000        0.000        7.513
   ETA 4       0.000        0.000        0.000        7.460
```

```
18 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                                   Page  17
03.35.15     University of Alberta

          THETA EPS

               ACCOMP      UPSET       PHYHLTH     DEMAND
ACCOMP          0.000
UPSET           0.000       0.000
PHYHLTH         0.000       0.000       0.000
DEMAND          0.000       0.000       0.000       0.000

          THETA DELTA

               EIPMOS
EIPMOS          0.000
```

```
18 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                                   Page  18
03.36.18     University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

          CORRELATIONS OF ESTIMATES

               BE 3 1      BE 3 2      BE 4 1      BE 4 2      BE 4 3      GA 1 1      GA 2 1      GA 4 1      PH 1 1      PS 1 1
  BE 3 1        1.000
  BE 3 2        0.006       1.000
  BE 4 1        0.010       0.002       1.000
  BE 4 2        0.000       0.008      -0.018       1.000
  BE 4 3        0.004      -0.011      -0.164       0.086       1.000
  GA 1 1       -0.001       0.000      -0.001       0.000      -0.000       1.000
  GA 2 1        0.000      -0.000       0.000      -0.001       0.000      -0.000       1.000
  GA 4 1       -0.000      -0.000      -0.088       0.056       0.001       0.004      -0.011       1.000
  PH 1 1        0.000      -0.000       0.000      -0.000       0.000      -0.001       0.001      -0.001       1.000
  PS 1 1       -0.011      -0.000       0.006      -0.000      -0.000      -0.001      -0.000      -0.001       0.000       1.000
  PS 2 2        0.000       0.007       0.000      -0.015      -0.000       0.000       0.001      -0.001       0.000      -0.000
  PS 3 3       -0.011       0.006      -0.002       0.001       0.015       0.000      -0.000       0.000      -0.000       0.000
  PS 4 4        0.000      -0.000       0.004      -0.014       0.015      -0.000       0.000      -0.002       0.000       0.000

          CORRELATIONS OF ESTIMATES

               PS 2 2      PS 3 3      PS 4 4
  PS 2 2        1.000
  PS 3 3        0.000       1.000
  PS 4 4        0.000       0.000       1.000
```

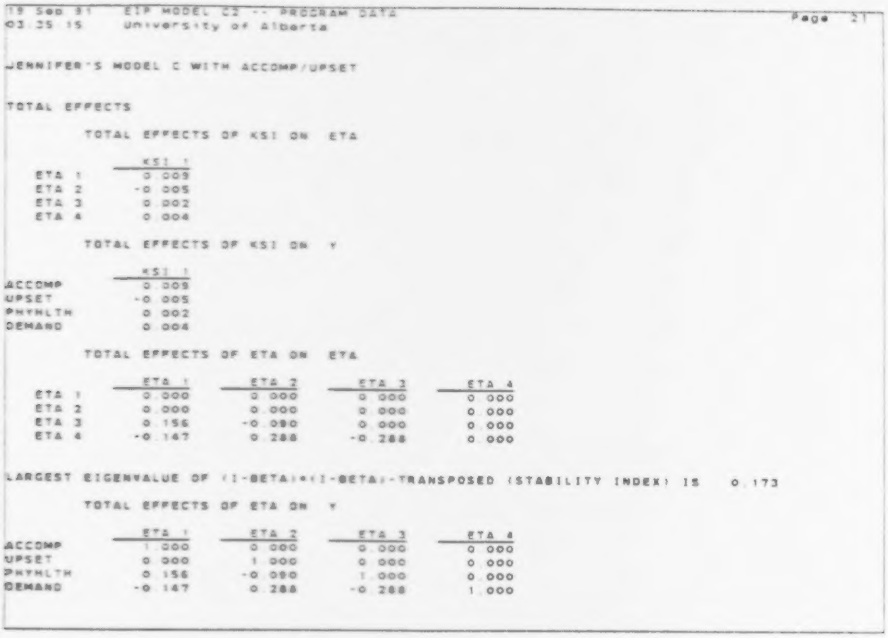


```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                    Page  19
03:35:15     University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

FITTED MOMENTS AND RESIDUALS

        FITTED MOMENTS

              ACCOMP      UPSET       PHYHLTH     DEMAND      EIPMOS
ACCOMP         0.826
UPSET         -0.004      0.828
PHYHLTH        0.123     -0.071       0.828
DEMAND        -0.111      0.223      -0.256       1.349
EIPMOS         0.811     -0.455       0.167       0.382      89.481

        FITTED RESIDUALS

              ACCOMP      UPSET       PHYHLTH     DEMAND      EIPMOS
ACCOMP         0.000
UPSET         -0.033      0.000
PHYHLTH        0.002     -0.005       0.001
DEMAND        -0.008      0.005       0.006      -0.003
EIPMOS        -0.011      0.007       1.344      -0.387       0.000

        NORMALIZED RESIDUALS

              ACCOMP      UPSET       PHYHLTH     DEMAND      EIPMOS
ACCOMP         0.000
UPSET         -0.480      0.000
PHYHLTH        0.029     -0.061       0.008
DEMAND        -0.085      0.048       0.080      -0.016
EIPMOS        -0.014      0.009       1.758      -0.374       0.000
```

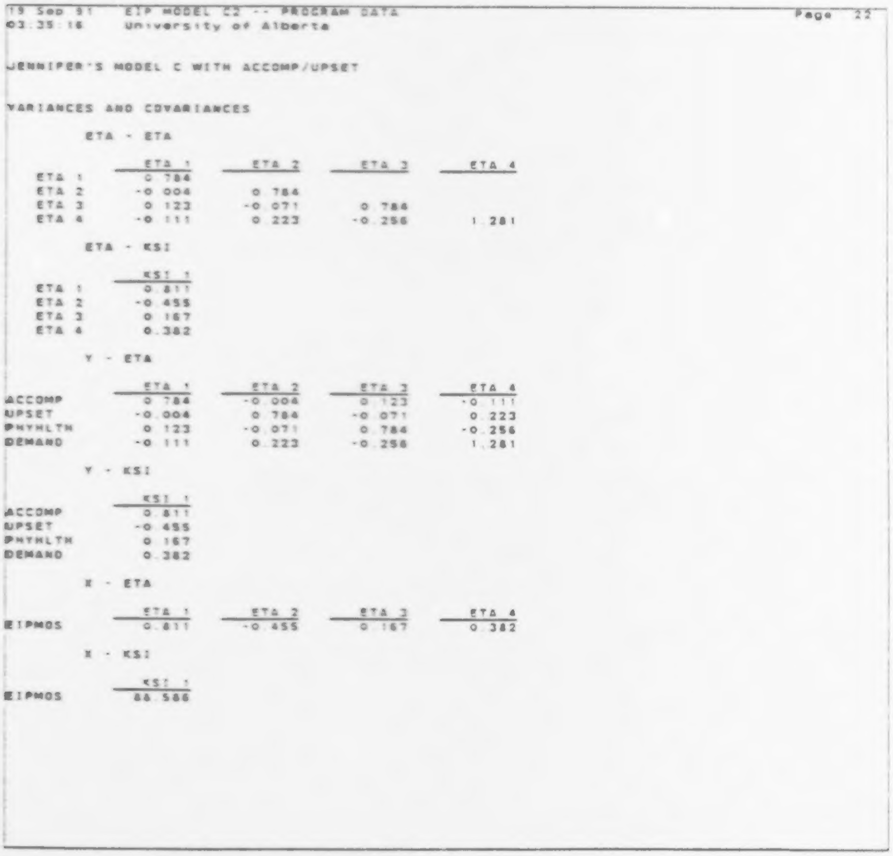


```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                    Page  20
03:35:15     University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET
```

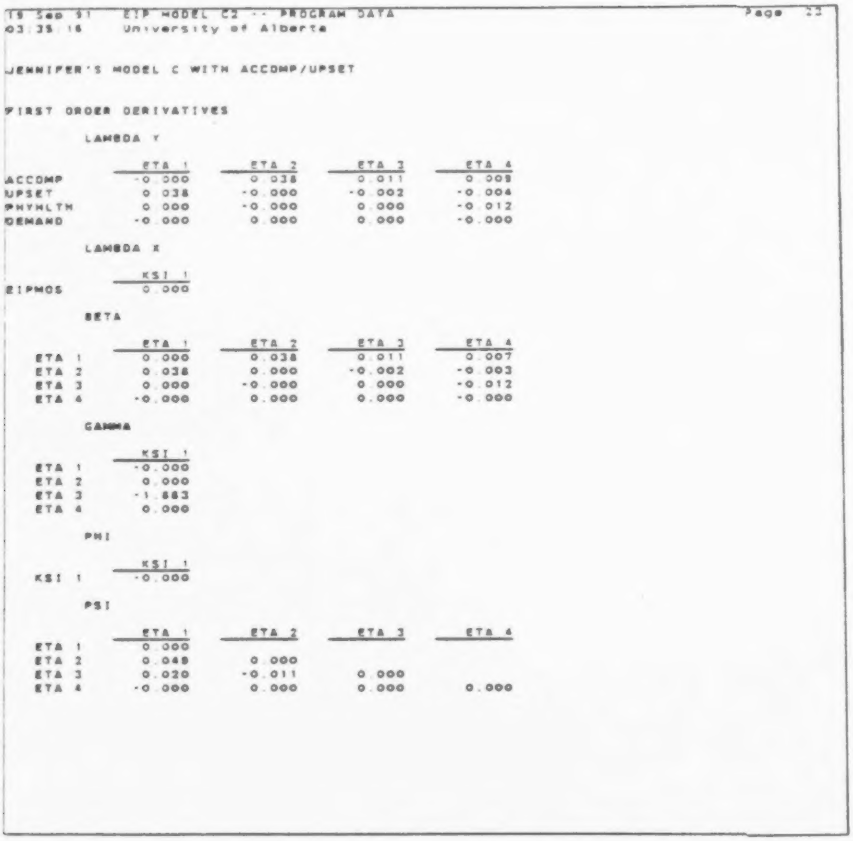
QPLOT OF NORMALIZED RESIDUALS



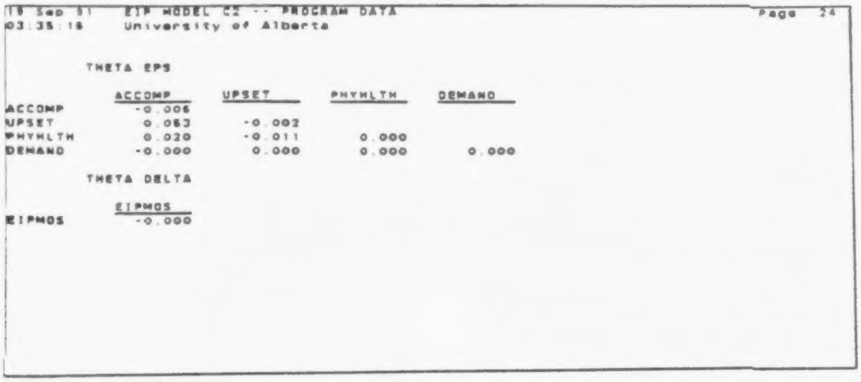
```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                      Page  21
03:35:15     University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

TOTAL EFFECTS

         TOTAL EFFECTS OF KSI ON  ETA

                 KSI 1
              ----------
   ETA 1          0.009
   ETA 2         -0.005
   ETA 3          0.002
   ETA 4          0.004

         TOTAL EFFECTS OF KSI ON  Y

                 KSI 1
              ----------
ACCOMP            0.009
UPSET            -0.005
PHYHLTH           0.002
DEMAND            0.004

         TOTAL EFFECTS OF ETA ON  ETA

                 ETA 1          ETA 2          ETA 3          ETA 4
              ----------     ----------     ----------     ----------
   ETA 1          0.000          0.000          0.000          0.000
   ETA 2          0.000          0.000          0.000          0.000
   ETA 3          0.156         -0.090          0.000          0.000
   ETA 4         -0.147          0.288         -0.288          0.000

LARGEST EIGENVALUE OF (I-BETA)*(I-BETA)-TRANSPOSED (STABILITY INDEX) IS   0.173

         TOTAL EFFECTS OF ETA ON  Y

                 ETA 1          ETA 2          ETA 3          ETA 4
              ----------     ----------     ----------     ----------
ACCOMP            1.000          0.000          0.000          0.000
UPSET             0.000          1.000          0.000          0.000
PHYHLTH           0.156         -0.090          1.000          0.000
DEMAND           -0.147          0.288         -0.288          1.000
```



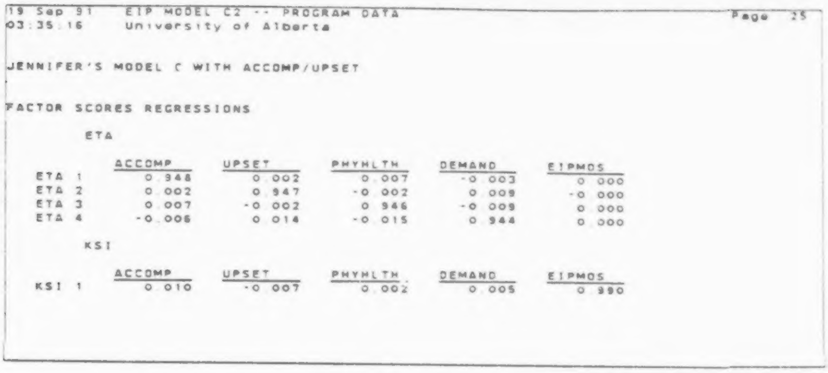
```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                      Page  22
03:35:16     University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

VARIANCES AND COVARIANCES

         ETA - ETA

                 ETA 1          ETA 2          ETA 3          ETA 4
              ----------     ----------     ----------     ----------
   ETA 1          0.784
   ETA 2         -0.004          0.784
   ETA 3          0.123         -0.071          0.784
   ETA 4         -0.111          0.223         -0.256          1.281

         ETA - KSI

                 KSI 1
              ----------
   ETA 1          0.811
   ETA 2         -0.455
   ETA 3          0.167
   ETA 4          0.382

         Y - ETA

                 ETA 1          ETA 2          ETA 3          ETA 4
              ----------     ----------     ----------     ----------
ACCOMP            0.784         -0.004          0.123         -0.111
UPSET            -0.004          0.784         -0.071          0.223
PHYHLTH           0.123         -0.071          0.784         -0.256
DEMAND           -0.111          0.223         -0.256          1.281

         Y - KSI

                 KSI 1
              ----------
ACCOMP            0.811
UPSET            -0.455
PHYHLTH           0.167
DEMAND            0.382

         X - ETA

                 ETA 1          ETA 2          ETA 3          ETA 4
              ----------     ----------     ----------     ----------
EIPMOS            0.811         -0.455          0.167          0.382

         X - KSI

                 KSI 1
              ----------
EIPMOS           86.586
```



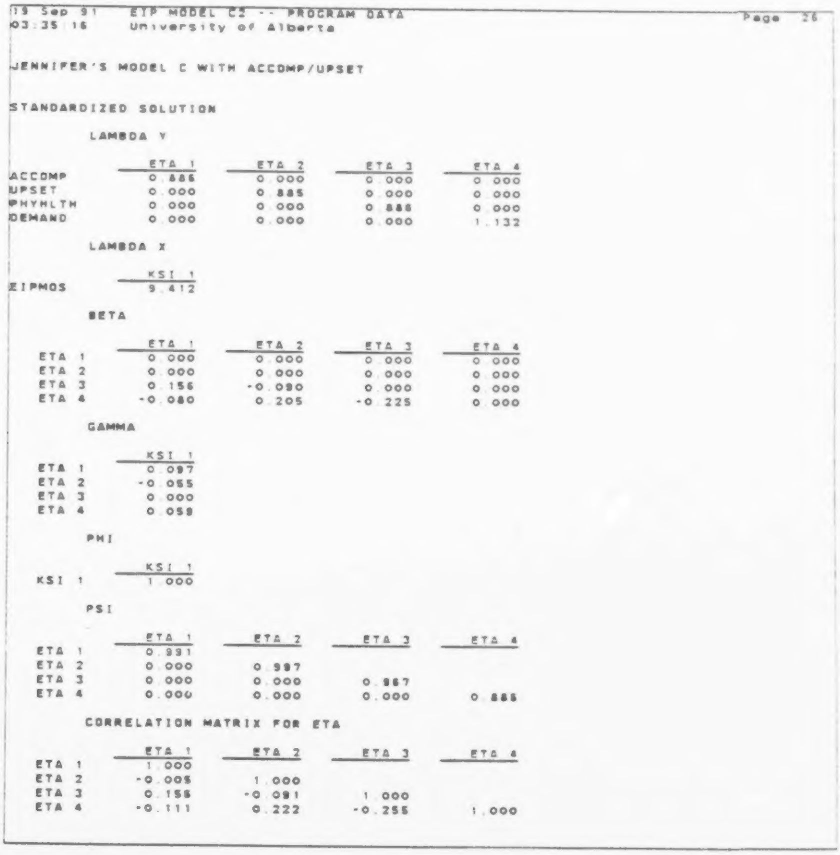
```
19 Sep 91     EIP MODEL C2 -- PROGRAM DATA                                    Page  23
03:35:16      University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

FIRST ORDER DERIVATIVES

        LAMBDA Y

                ETA 1       ETA 2       ETA 3       ETA 4
ACCOMP         -0.000       0.038       0.011       0.009
UPSET           0.038      -0.000      -0.002      -0.004
PHYHLTH         0.000      -0.000       0.000      -0.012
DEMAND         -0.000       0.000       0.000      -0.000

        LAMBDA X

                KSI 1
EIPMOS          0.000

        BETA

                ETA 1       ETA 2       ETA 3       ETA 4
   ETA 1        0.000       0.038       0.011       0.007
   ETA 2        0.038       0.000      -0.002      -0.003
   ETA 3        0.000      -0.000       0.000      -0.012
   ETA 4       -0.000       0.000       0.000      -0.000

        GAMMA

                KSI 1
   ETA 1       -0.000
   ETA 2        0.000
   ETA 3       -1.883
   ETA 4        0.000

        PHI

                KSI 1
   KSI 1       -0.000

        PSI

                ETA 1       ETA 2       ETA 3       ETA 4
   ETA 1        0.000
   ETA 2        0.049       0.000
   ETA 3        0.020      -0.011       0.000
   ETA 4       -0.000       0.000       0.000       0.000
```



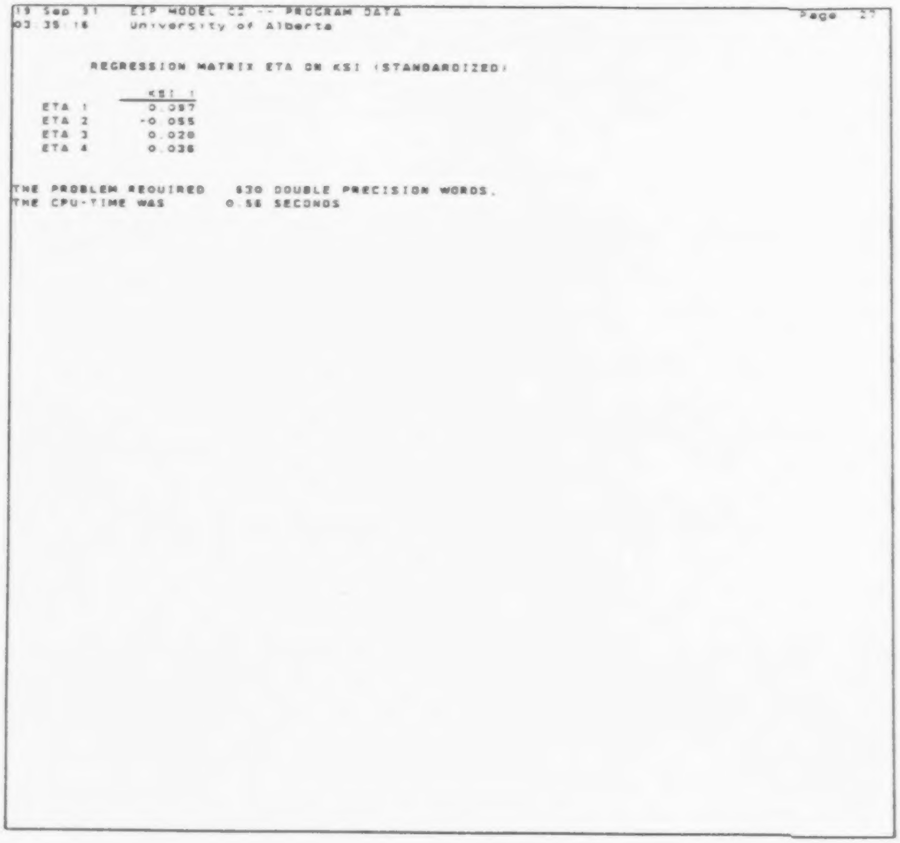
```
19 Sep 91     EIP MODEL C2 -- PROGRAM DATA                                    Page  24
03:35:16      University of Alberta

        THETA EPS

               ACCOMP      UPSET       PHYHLTH     DEMAND
ACCOMP         -0.006
UPSET           0.063      -0.002
PHYHLTH         0.020      -0.011       0.000
DEMAND         -0.000       0.000       0.000       0.000

        THETA DELTA

               EIPMOS
EIPMOS         -0.000
```



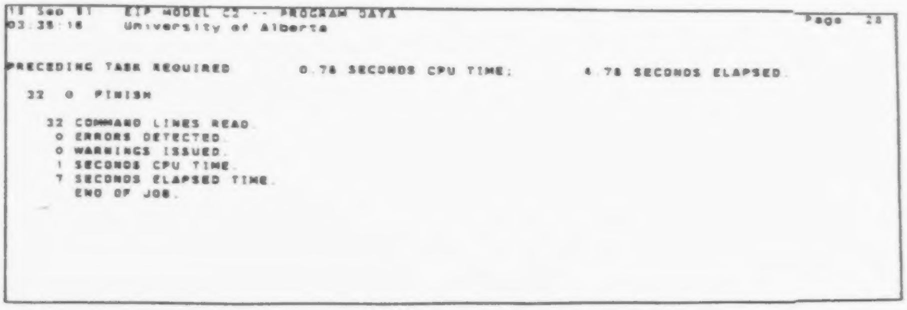
```
19 Sep 91     EIP MODEL C2 -- PROGRAM DATA                                    Page  25
03:35:16      University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

FACTOR SCORES REGRESSIONS

        ETA

              ACCOMP      UPSET       PHYHLTH     DEMAND      EIPMOS
   ETA 1        0.948       0.002       0.007      -0.003       0.000
   ETA 2        0.002       0.947      -0.002       0.009      -0.000
   ETA 3        0.007      -0.002       0.946      -0.009       0.000
   ETA 4       -0.006       0.014      -0.015       0.944       0.000

        KSI

              ACCOMP      UPSET       PHYHLTH     DEMAND      EIPMOS
   KSI 1        0.010      -0.007       0.002       0.005       0.990
```



```
19 Sep 91     EIP MODEL C2 -- PROGRAM DATA                                    Page  26
03:35:16      University of Alberta

JENNIFER'S MODEL C WITH ACCOMP/UPSET

STANDARDIZED SOLUTION

        LAMBDA Y

                ETA 1       ETA 2       ETA 3       ETA 4
ACCOMP          0.886       0.000       0.000       0.000
UPSET           0.000       0.885       0.000       0.000
PHYHLTH         0.000       0.000       0.886       0.000
DEMAND          0.000       0.000       0.000       1.132

        LAMBDA X

                KSI 1
EIPMOS          9.412

        BETA

                ETA 1       ETA 2       ETA 3       ETA 4
   ETA 1        0.000       0.000       0.000       0.000
   ETA 2        0.000       0.000       0.000       0.000
   ETA 3        0.156      -0.090       0.000       0.000
   ETA 4       -0.080       0.205      -0.225       0.000

        GAMMA

                KSI 1
   ETA 1        0.097
   ETA 2       -0.055
   ETA 3        0.000
   ETA 4        0.059

        PHI

                KSI 1
   KSI 1        1.000

        PSI

                ETA 1       ETA 2       ETA 3       ETA 4
   ETA 1        0.991
   ETA 2        0.000       0.997
   ETA 3        0.000       0.000       0.987
   ETA 4        0.000       0.000       0.000       0.885

        CORRELATION MATRIX FOR ETA

                ETA 1       ETA 2       ETA 3       ETA 4
   ETA 1        1.000
   ETA 2       -0.005       1.000
   ETA 3        0.155      -0.091       1.000
   ETA 4       -0.111       0.222      -0.255       1.000
```



```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                        Page  27
03:35:16     University of Alberta

       REGRESSION MATRIX ETA ON KSI (STANDARDIZED)

                  KSI 1
                --------
   ETA 1          0.087
   ETA 2         -0.055
   ETA 3          0.028
   ETA 4          0.036

THE PROBLEM REQUIRED    830 DOUBLE PRECISION WORDS.
THE CPU-TIME WAS        0.58 SECONDS
```



```
19 Sep 91    EIP MODEL C2 -- PROGRAM DATA                                        Page  28
03:35:16     University of Alberta

PRECEDING TASK REQUIRED       0.78 SECONDS CPU TIME;       4.78 SECONDS ELAPSED.

  32  0  FINISH

    32 COMMAND LINES READ.
     0 ERRORS DETECTED.
     0 WARNINGS ISSUED.
     1 SECONDS CPU TIME.
     7 SECONDS ELAPSED TIME.
       END OF JOB.
```